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AT THE ICE KING'S BOARD

By JOHN LINDSEY BLACKFORD

Illustrated by Edmund J. Sawyer

WHEN winter, stern Ice King, leaves his Arctic lair and launches a swirling white offensive from out of the North, a great host of our bird friends flee to the South, for they know that no places are set at his crystal banquet board for them. In truth, if winter takes them unawares with a sudden foray, they find their once bounteous tables bare or buried beneath his snows, and they learn once more that his warnings are not hollow threats but carry the death they promise. Only the children of his own adoption and training know the devious ways into his storerooms, and for them alone is the table spread.

Despite his driving storms, his gripping cold, his interminable nights, winter in his own way makes provision for his avian wards. Although sleet, and wind, and drift may turn once verdant shelters into shelterless wastes, the vast evergreen forests of the North remain as always fortified havens of safety; although he prepares no repasts, the bounties of summer and autumn are preserved by cold storage methods for the benefit of the birds. For some the fare is scanty; for all the prize comes only with effort and after dangers have been risked and overcome. For this is winter's provision—to every feathered fighter, a fighting chance.

"EVENING GROSBEAKS WINTER IN THE LOWER VALLEYS"

Here in our northern Rocky Mountain region, among the gleaming peaks that decorate the great Cordilleran Highland, in its deep valleys, and by its swift, blue, ice-mantled rivers, there is no better place to study the bird citizenry of winter's wide domain. Let us open the door to the Frost Monarch's cupboard and discover how they fare when he takes possession of the land.

Some of these northerners, particularly well adapted to certain feeding habits, find a varied and bountiful table set for them. Fruit pits and seeds that defy the appetites of most birds yield readily to the crushing and shearing power of the stout, heavy mandibles of the grosbeaks. Seeds of mountain ash berries and conifer nutlets, together with the plump kernels of chokecherry pits, and the seeds of mountain maple, boxelder, mallow and snowberry, and of dogwood, elderberry, and juniper, are on the bill of fare of the western evening grosbeak, who comes from his summer home in the yellow pine forests of western mountains and the pine hills of the transition zone to winter in the lower valleys. Occasionally claimed by wanderlust, flocks of evening grosbeaks, northern relatives of our striking mountain hawfinch, may migrate to the Atlantic seaboard (although these eastern bound tramps are more likely to hail from the pine woods of Michigan or Manitoba), adding enroute seeds of sumac and of frozen orchard fruits to their diet.

It is to join in similar repasts that the Rocky Mountain pine grosbeak descends into the valleys when winter captures the heights. From the Hudsonian Zone, that high region beginning where the trees first assume a stunted and storm-wracked appearance and continuing on up to timberline, of which faunal area he is the characteristic bird, this grosbeak migrates in flocks. And since he is almost entirely a vegetarian, he partakes likewise of all the foods favored by his black, yellow and white relative.

A cosmopolitan taste accepts the seeds of honeysuckle, huckleberries, service berries, of black and red haws, and relishes the staminate buds of pines, and the buds of maple, ash, spruce, and willow, and

the fruit pulp of mountain ash berries. Weed seeds, too, are not overlooked.

The indiscriminate and wholesale clearing of valley lands, with perhaps at the best only the vague idea that timbered uplands will provide adequate cover for bird life, has been a practice destructive to many species. Since it overlooks the altitudinal migrations of our permanent feathered residents, and also deprives many summer birds of their natural habitats, such clearing at lower levels has inevitably reduced the number of the farmer's, the horticulturist's, and the lumberman's avian allies, and thinned the ranks of others treasured as much by Nature lovers. A wood lot left here and there, a thicket on some rocky ridge, dense boscage along the water courses, a bit of wild country preserved on submarginal land bordering the agricultural area, will not only yield economic return but will pay dividends in this business of living.

"WE MAY SOON DISTURB A GRAY RUFFED GROUSE AT HIS DINNER"

Some afternoon let us hike across the fields to the river. Along the way where wild mustard, smartweed, pigweed and dock stand in defiant crowded ranks bordering the fences, small bird banqueters are reveling under plumbeous skies. Here are wintering a number of Merrill's song sparrows, happily secure in their dependence on plant storehouses. Groundsel, foxtail, timothy, meadow fescue, wild oats, native grasses and seeds of sedges are other attractions to ground foragers.

By the river the vermilion fruit of the red haws give gay color to the drab undergrowth on the bank. Back along a small stream we were hung up momentarily on other thorn trees still carrying their black fruit.

Strong as are the forces of ice and snow in our northern states they do not succeed in locking completely the swifter reaches of the rivers. Leaving its broad and marshy stretches, the Kootenai gradually increases its gradient on entering northwestern Montana from Canada. Once again among great mountains it changes to a powerful, fast-flowing stream, bends like a tightly drawn bow, and returns to the Dominion through Idaho. The waters of the river, shifting from side to side in their rocky channel, rushing with continuous roar upon huge boulders bulging from the bed, and running rapid after rapid with tumultuous energy, are ever a challenge to the Ice King's authority.

For miles the Kootenai may be locked from bank to bank, yet winter's most bludgeoning cold never quite conquers the rapids, nor bridges entirely the racing currents. During many weeks of the colder months the river is merely ice-bordered, or there are long open channels of dark, sullen water that persist where the bed is deep and narrow until the strongest attacks are made upon them. And it is because these forbidding reaches of open water are to be found along our larger water courses in the northern Rocky Mountains that the American golden-eye finds a winter home here.

Half an hour's tramp up-stream is followed by an attempt to squirm noiselessly through tangled cover on the bank, and train our prismatics upon a rift at the head of a long channel where swift boiling currents meet below a gravel bar as the larger flow surges over to join the nearer and smaller one. At the upper end of the bar great blocks and cakes of thick ice have been driven and piled upon the ambitious islet. Heaps of frozen slush and pressure ridges are evidence of the river's struggle with the tenacious cold.

Quickly we catch the movement of a duck dropping from the ice into the water and bobbing up to join three others. The distinctive plumage of the males proclaim their kind. The small party is a mid-winter outpost of the golden-eyes that occur only in limited numbers near the boundary at this time of the year. That they are here at all, when most ducks are thousands of miles to the south, is the miracle.

Warily the quartet widen the distance between us, and presently, fully alarmed, the whistlers get up swiftly and with the wind singing strangely in their wings are off up river. Great travelers are these aerial speedsters, and through tickets they must have, to be sure, if they are to reach the infrequent stretches of open water and garner their aquatic food.

A dietary picture of the golden-eyed ducks that winter in the open portions of the Missouri River below the First Avenue bridge in Great Falls, Montana, is given us by Louis Wessel, naturalist: "They seek such spots in the stream where the current is swift enough to keep the ice from crusting over, and where the water is deep enough, and yet the bottom is not too far away, to yield a supply of insects, crustaceans, mollusks and tender vegetation."

In another dietetical revelation W. L. Dawson wrote, naïvely serious: "If we had to be a duck, we would elect to have golden eyes and to chase mischievous water bugs through limpid icy pools, while nodding little fir trees looked on and applauded."

This handsome waterfowl is recorded as wintering in other parts of the state all along the Missouri from Three Forks to Great Falls, on the Yellowstone above Livingston, on the Judith, in the Bitterroot Valley from December to March, and also at Flathead Lake.

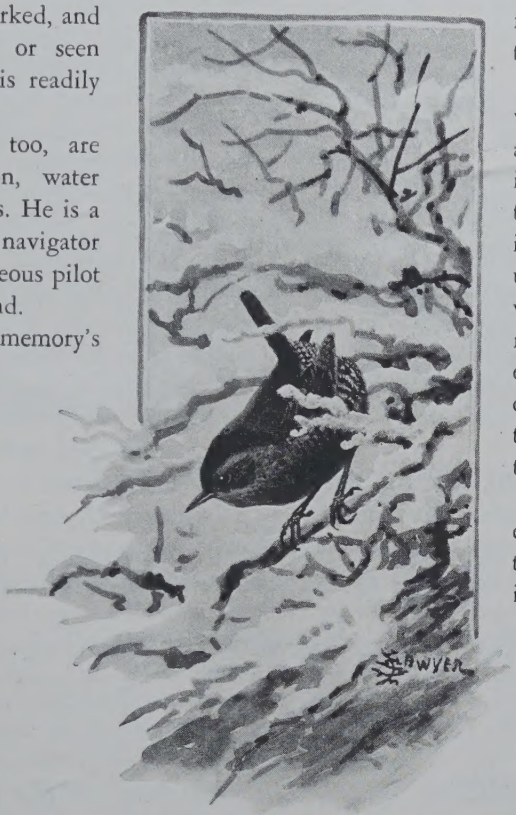
The brave sight of them, swimming, diving, frolicking and breasting the current, is one of the rare wonders a river can share with us. In a sense they belong to

you and to me and if we do not see them, study them, and protect them, we are not exercising the rights of our ownership.

Occupying the same winter quarters as his kinsman, but with a general line of retreat no farther south than the latitude of central Montana, is the Barrow's or Rocky Mountain golden-eye. Wearing a headdress of iridescent purple instead of the former's greenish black hood, and with a triangular spot of white instead of a circular one in front and below the brownish yellow eye, with his white collar and black and white body coloration, he is distinctly marked, and whether glimpsed in flight or seen riding high on the surface is readily recognized.

Delicacies to his palate, too, are water weeds and vegetation, water bugs, mussels and crustaceans. He is a grebe-like diver, an expert navigator of watery trails, and a courageous pilot of the airways of a frozen land.

What an etching for memory's album—wild pinions over a winding white waterway, dark-spired spruces climbing the steep banks that curve away to claim the river for their own, and, above and beyond when the clouds break, the high ranges gleaming, sparkling, scintillating, jeweled by the low sun. Little wonder then that we may turn few other such pages.



"WE MAY CONTINUE IN THE RÔLE OF HOSTS TO THE WESTERN WINTER WREN"

Facing the razor-edged winds of winter, together with our aureate-eyed swimmers, are three members of the subfamily Merginae, the American, the red-breasted and the hooded mergansers. While of wide distribution, the so-called fish-eating ducks are present only in limited numbers in the more northern states at this season. Fisherman's luck with them in the icy rapids is a case of championship diving, torpedo-like swimming, of Spartan hardihood, and of strong hearts.

"Fish-eating ducks" is a term certain to arouse antagonisms in the average angler and one quite misleading as to the true economic status of these web-footed fisher folk. Their work in capturing spawn-eating fishes, predacious diving beetles, giant waterbugs, aquatic larvae that are destructive to fish fry, and crayfish and other crustaceans, is directly in the interests of fish conservation, and more than balances in most areas such catch as they are able to make of the swifter and more elusive game fish. It is axiomatic that fish-eating birds take what is common and easy to get. Following detailed studies, field naturalists of the Biological Survey conclude that the choice of food of this class of birds is so largely governed by availability that in most waters they will get only a small proportion of game and commercial fishes, as it is in small proportions that these fishes occur.

"Anglers wondering what becomes of the immense number of trout fry that are planted in streams," the Bureau states in its report on these studies, "naturally attribute their disappearance to the enemies that are most obvious, and they are particularly likely to blame the larger fish-eating birds." Investigations along trout streams, however, by the Biological Board of Canada, show that the greatest losses in trout fry are caused by enemy and competitor fishes.

A discussion by the Biological Survey closes with the opinion that availability of food is the basis of the feeding habits of fish-eating birds, and that this results as a rule in the birds preying largely not upon game fishes but upon the fish enemies of game fish, which constitute the greatest obstacle to restocking operations. About fish hatcheries where the condition of what is common and easy to get is reversed, the Bureau permits of intelligent control.

"Incessant gunfire has made it exceedingly wild," said Mr. Dawson of the beautiful hooded merganser. But it is to be hoped that with a better understanding in regard to their poor food value, and a clearer realization of the mergansers' relation to game fishes, we may more commonly experience the beauty and charm lent by their presence to our lakes, creeks, and rivers.

From overhead as we turn away from the bank comes the hoarse croak of a raven. Whether in solemn passage across open country or seen atop some wooded crest surveying his domain, the American raven lends a note of dignity not entirely in keeping with his profession. However, despite his gastronomic versatility and though all outdoors is now an icebox, his shelf is often empty.

Where winter lies upon the land a scavenger must trust to luck, for he is truly the forgotten bird. Consequently our sable friend has become a connoisseur of anything he can find to eat. Yet he is a waggish fellow, this entertaining wiseacre, who, if we are to judge by his asthmatic croakings, has never recovered from a very bad cold. One would scarcely be surprised if his throaty remarks were to be interrupted now and then by a fit of coughing.

If we leave the cut-over land and push back into the dense glades and forested gulches of the hills or perchance wander through some undespoiled vale, we may soon disturb a gray ruffed grouse at his dining. The meal may include berries of Nature's own preserving. Regu-

larly on their menu are bunch and juniper berries, and when available those of kinnikinnic. Wild roses, hawthorns, and the skunk cabbage contribute fruit to their winter diet. Staples at this season, increasing in proportion as cold weather lasts and the ground remains covered, are the buds and twigs of poplar, aspen, birches and chokecherry, catkins of birch, and buds of willow and maple. Seeds are taken, and, before they are gone, leaves of fern and goldenrod.

A proud, handsome bird, the ruffed grouse, whose fine woodcraft enables him to defy the cold and thwart the many dangers of the northern winter. He is of the nobility of our woodlands.

Similar food habits are followed by Franklin's grouse, which, in addition, relishes the buds of spruces and tamaracks. The common name of fool hen often is applied by those of the same mentality who persist in his extermination.

Richardson's, a form of the dusky, locally known as the blue grouse, has unlocked a strange storehouse. As an old prospector remarked to me: "They set up in the trees and fill up on fir needles." Nevertheless, nutriment and energy are found in the resinous foliage and buds sufficient to sustain them even when the mercury drops to unfrequented low levels.

Winged wanderers are the crossbills, which in dextrous fashion have opened the storechests of the conifers. Seeds of western yellow and scrub pines constitute the bulk of their food at all seasons, and to a lesser extent those of white pine, hemlock, and spruce. By ornithologists who have studied the feeding habits of the common or red crossbill (in this section represented by Bendire's), we are told that the birds shell each seed, removing even the thin inner coat; only the soft white endosperm and embryo are eaten. The rather large percentage of animal food consumed decreases greatly when snow comes, although spiders and fly larvae, probably discovered upon the trees to which they resort for their other rations, still continue to attract them.

Occasionally flocking with the red, but of more northern distribution than that species, are the white-winged crossbills. Cones of spruce and hemlock furnish their principal fare, while buds of these two trees, seeds of the balsam fir, and, more rarely, juniper berries are additional sources of supply. The seed of sunflowers, of foxtail grass, and of weeds, together with a limited amount of wild fruit, are other items in Winter's cupboard that enable the white-wings to keep the North as their permanent home. Hibernating larvae form the major part of their insect food.

Among the avifauna of this great mountain region are a number of other species which, when they migrate southward, maintain a scattered but hardy rearguard along the front of Winter's advance and within his skirmish lines. Thus we may continue in the privileged rôle of host to the pale goldfinch, the western winter wren, the common mallard, and the western belted kingfisher.

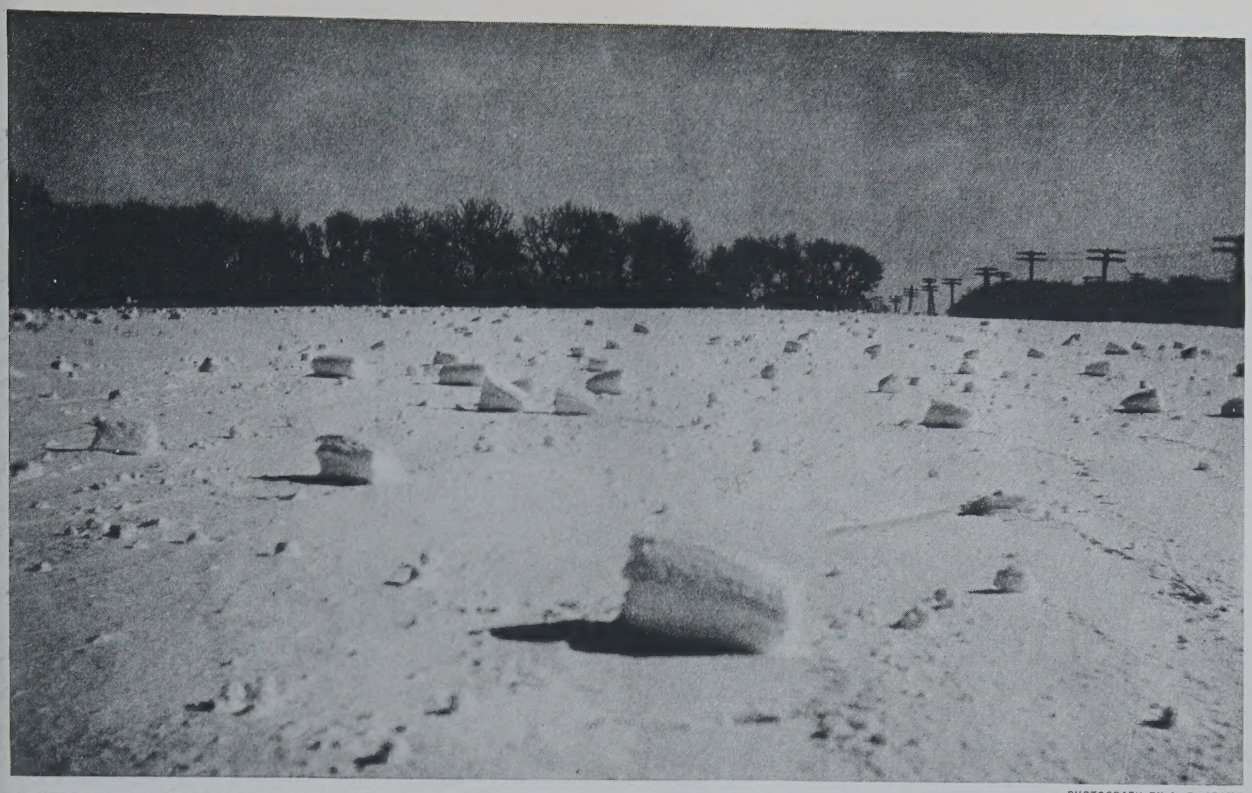
As we return across the fields the brief day is hurried away by the enveloping dark. Short indeed are the daylight hours in which to garner a livelihood, while the hours of darkness, when each of these feathered friends must be hidden away from the hard-pressed predators of the night, last twice as long. Yes, to be of Winter's wildfolk one must have enduring fortitude.

The Dwarf Maple

By ESTHER E. REEKS

THE daintiest of all maples is a shrub rather than a tree. It is the *Acer glabrum,* or dwarf maple, found growing beside streams and on rocky hillsides from western Nebraska and Wyoming south to New Mexico, at altitudes of from four to nine thousand feet. The leaves of this maple are like those of the hard maples in shape, but seldom more than an inch and a half in width. They are a light, yellowish green; but the buds, stems, and young twigs are tinged with red.

The flowers appear in clusters and have all the parts—sepals, petals, stamens, and a two-styled pistil. They are small and greenish-white in color. As the petals drop, the two-lobed ovary develops into two reddish, winged seeds on a single stem. The leaves of this maple turn in autumn to a light yellow. But in summer they frequently have a bright red, velvety margin, made up of minute galls caused by the sting of some tiny insect. I once discovered the nest of a mountain rat composed entirely of the twigs and leaves of this shrub, which might be taken as evidence that its builder had an eye for beauty.



PHOTOGRAPH BY A. E. ADAMS

A SPLENDID COLLECTION OF SNOW ROLLERS

Muff-shaped masses of snow, formed in thousands by the wind on fields and lawns when the snow has just the right consistency for their production

NATURE "ROLLS HER OWN"

By CHARLES FITZHUGH TALMAN

It is a dull winter when the newspapers do not report the appearance in some part of the country of wind-rolled masses of snow, looking more like the work of man than of Nature and usually found in great numbers on fields and lawns over a restricted area. Because they are rare in any one locality, few people have ever seen them more than once, so that each case is generally described as an unheard-of wonder. The average meteorologist has never been so lucky as to see them at all but knows them through numerous descriptions recorded over a period of more than a century, and calls them "snow-rollers".

In a majority of cases these formations are rolled during the night and first noticed in the early morning, but in a good many they have been seen in process of production. The rollers are usually cylindrical and more or less hollowed out at the ends, so that they have the general shape of a lady's muff. They may range from a few inches in diameter up to the size of barrels. Each is found at the end of a long trough in the snow, marking the path along which the rolling occurred. The trough tapers in diameter, being broadest next to the roller and narrowest at the point where the rolling began.

The typical snow-roller is light and falls to pieces or barely holds together when lifted. In many cases the hollow at the ends extends right through. The cylindrical shape is usual, but spherical forms have been reported. A photograph of a perfectly ball-shaped snow-roller was published in the *Meteorologische Zeitschrift* for October, 1931.

Thoreau, who learned much about Nature from personal observation but little from books, had probably never heard of snow-rollers when, as he records in his Journal, he found numbers of them one day lying in the fields. They had been formed by the wind on the previous day.

"These masses," he says, "were generally six or eight inches high—though they must have wasted and settled considerably—and a little longer than high, presenting a more or less fluted appearance externally. They were hollow cylinders, about two inches in diameter within, like muffs. Here were a dozen within two rods square, and I saw them in three or four localities miles apart, in almost any place exposed to the sweep of the northwest wind. There was plainly to be seen the furrow in the snow produced when they were rolled up, in the form of a very narrow pyramid, commencing perhaps two inches wide and in the course of ten feet (sometimes of four or five only) becoming six to eight inches wide, when the mass was too heavy to be moved further.

"The snow had thus been rolled up even, like a carpet. This occurred on perfectly level ground and also where the ground rose gently to the southeast. The ground was not laid bare. That wind must have rolled up masses until

they were a foot in diameter. It is certain, then, that a sudden strong wind when the snow is moist but light will catch and roll it up as a boy does his ball."

One of the cases in which snow-rollers were observed in the making occurred in Maine in 1919 and was described as follows by Professor L. E. Woodman:

"About four inches of dry snow fell during the afternoon and night of March 2. Toward the end of the storm the flakes were very large and the wind blew at a considerable velocity. This high wind continued most of the day of March 3. After the sun had been shining on the snow for three or four hours and had probably formed a thin layer of moist snow on top, the wind would catch up a portion of this moist snow and roll it over and over, forming a snowball of increasing size until the gust of wind had spent its energy, or the ball had become too large to be rolled any farther. Some people who saw this process taking place said that the fields were literally alive with moving snowballs. This peculiar phenomenon continued until about noon and the fields around Orono and Bangor were left with countless snowballs everywhere."

PHOTOGRAPH BY A. E. ADAMS

A FINE SPECIMEN

At the left may be seen the shallow trough along which this white muff was rolled

At Davenport, Washington, on the afternoon of January 17, 1913, during a strong gust of wind, snow-rollers were seen to form in vast numbers in the brief space of a minute and a half. The growth of a snow-roller under the action of the wind is no mystery, since every schoolboy has rolled snowballs for himself in snow of proper consistency. The muff-like shape is evidently due to the fact that the mass gathers snow at its ends as it rolls so that the outer layers are longer than the inner. Occasionally the rolling occurs in several directions, producing a more or less ball-shaped mass instead of a cylinder. All this is clear; but where do the initial masses come from, and how does it happen that so many are ready for rolling about the same time?

In one case, reported a few years ago, the rollers were seen to start where small masses of moist snow were hurled by a sudden gust from the limbs of trees and from wire fences. Generally, however, it appears that eddies in the wind scoop up the initial snowballs, or in some cases the wind breaks off slight projections previously existing on the surface of the snow. From the descriptions thus far published we find that the conditions favorable for the occurrence of this interesting winter freak are the presence of a rather shallow layer of snow just damp enough to cling together, but not wet and heavy, overlying the hardened surface of older and drier snow. These conditions exist when, with snow already lying on the ground, more or less crusted at the surface, and with a temperature well below freezing, a light snowfall occurs, followed immediately by a rise of temperature to a little above the freezing-point.

Keep watch for snow-rollers this winter. If you see any, the Weather Bureau, in Washington, will welcome a description; especially if you are fortunate enough to witness the whole process of formation, including the production of the original small masses of snow from which the rollers grow. Good photographs of these will add to the value of your report.

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RED-BREASTED MERGANSERS UNMINDFUL OF THE CHILL OF WINTER WATERS

SYMBOL OF THE YULETIDE SEASON

Living, outdoor Christmas trees are growing in popularity and there is real beauty in such as this with its illumination and mantle of snow

WHAT KIND OF A CHRISTMAS TREE IS YOURS?

By C. FRANK BROCKMAN

On Christmas Eve more than fifteen million Christmas trees will be lighted in celebration of the beginning of the Yuletide. Throughout our land—throughout every land where Christmas is celebrated—this bit of fragrant evergreen is today an important feature of the season and yet, like that famous flower of poetical fame, it seems always destined to "blush unseen". Few people recognize their Christmas tree for what it really is—a spruce, hemlock, balsam or Douglas fir. They know it merely as a symbol of the season, as just a Christmas tree.

There are, of course, many kinds of evergreens that are used for this purpose. If, however, you live on the Pacific slope, your tree is almost sure to be one of a few small groups. Each of these has one or more distinctive features by which it can be readily recognized and an inspection of the tree in your home will bring them to light. As a mechanic searches for engine trouble beneath the hood of your car by checking, systematically, each unit of the mechanism until the trouble is found, so you should scrutinize your Christmas tree. Such an examination will reveal certain characters of distinction that will indicate the tree's identity. So examine *your* tree. Get acquainted with this symbol of the season and then you can readily answer the question which serves as the title of this article.

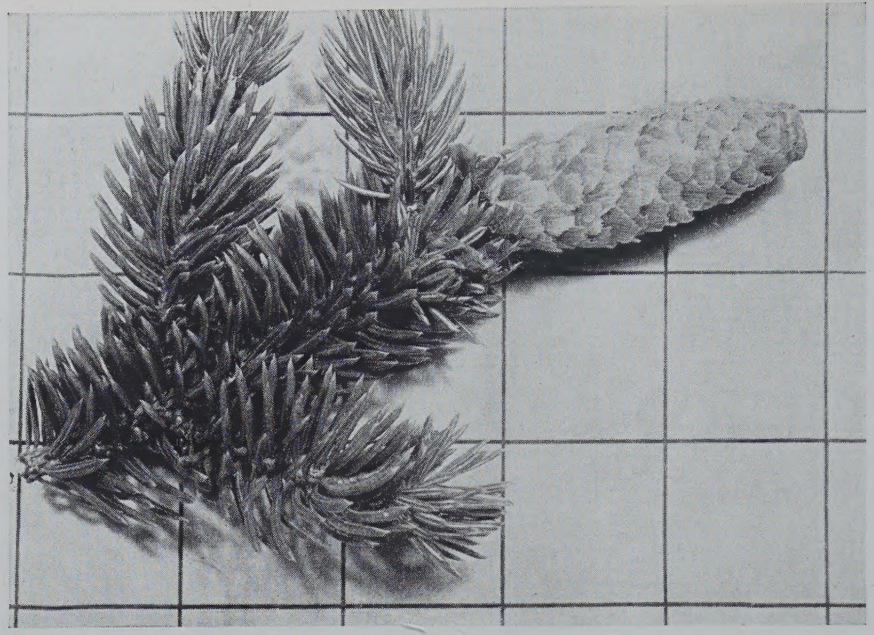
The spruces are the easiest of our Christmas trees to identify. Grasp a handful of your tree's foliage and squeeze it tight. Did you say "OUCH!"? If you did your tree is probably a spruce for their needles are, with the exception of the Sitka spruce, which is found in the Pacific Northwest along the coast, distinctly diamond-shaped in cross section, pointed, stiff and prickly to the touch. Now if you pinch or cut a spruce needle in half and examine its cross section you will see that it is, indeed, diamond-shaped. Those of the Sitka spruce, however, are only indistinctly four-angled in cross section, being thick and more oval in cross section.

Yet there is still another feature by which a spruce may be identified. Examine a small branch from which the foliage has been removed or from which it has fallen. It will have a rough appearance because the individual needles are attached to small woody bases that remain upon the branch after the needles have dropped off.

Spruces, then, present a stiff bristly appearance and in the case of some species the foliage is silvered at the tips of the branches; in all cases the central leader is erect, stiff and strong. This feature is mentioned in passing because the ap-

FOLIAGE AND CONES OF DOUGLAS FIR

This is one of the most common Christmas trees and has certain definite characteristics to identify it



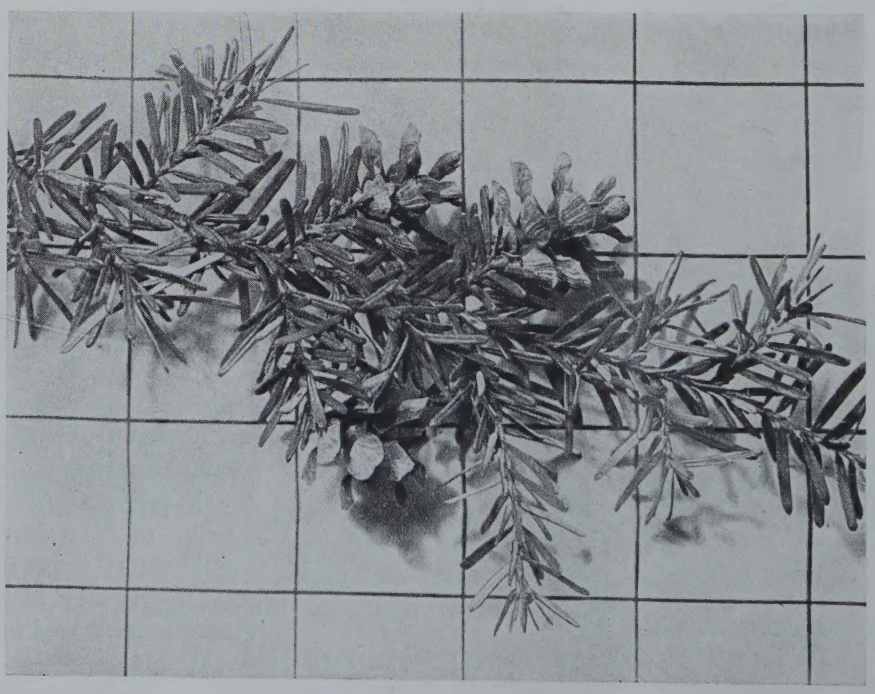
A WESTERN SPRUCE

Its four-sided needles easily identify it. The squares in the background are one inch in size

pearance of the central leader of the hemlock is quite opposite. It is the weak central leader, drooping under its own weight, that serves as a good indicator of this tree.

Now if you are a member of that "school" of Christmas tree decorators that insists upon crowning the tip of its tree with some heavy, glittering ornament you should never choose a hemlock. The wilting character of the tree's tip is not suited for such a crowning glory. Moreover, unlike the stiff, prickly foliage of the spruce, the hemlock needles are flat and soft to the touch. Their tips are blunt instead of sharply pointed and the base of the needles is narrowed and possessed of a slight twist so that the needles point in all directions from the stem. This gives the tree a soft, lacy appearance that renders it one of the most beautiful of our evergreens. So if you suspect that you have a hemlock in your parlor look for the weak central leader and the soft, flat and lacy foliage.

The wilted or nodding character of the tree's tip is the best general indicator of the hemlock, however, for both the balsam and Douglas fir have soft foliage. The central leader of these latter named trees is erect and, although not as stiff and strong as that of the spruce, is able to support some heavy tree-top ornament if desired. Take the balsams, for instance. Botanically these trees are known as "abies" or true firs and there are several species native to our country. All have one principal character by which the group is recognized regardless of any specific differences that may occur between the individual members. If your tree is a balsam or true fir and you pull a few needles from the branches conspicuous round leaf scars will be visible upon the defoliated twig. No other native evergreen cone-bearing tree is so characterized. The reason for this round leaf scar becomes evident on an examination of the individual needles. Instead of being narrowed at the base they broaden out, the oval base being attached to the twig. The needles are blunt at the tip, are often notched at that point and their underside is conspicuously marked by two silvery lines, being several rows of pores known as stomata. So, in the case of the true firs look first for the round leaf scars when you pull a few needles from the twig but at the same time remember that these trees are also characterized by blunt, comparatively wide and long needles, a stiff central leader and soft foliage.



FOLIAGE OF HEMLOCK

The needles are soft and flat and the cones on small trees hang from the tips of the branchlets

And now we come to the last of the trees commonly used for Christmas purposes—the Douglas fir. It is by far the most generally accepted for this use today and, with our modern methods of transportation, it is often found in a home far removed from its native western mountains.

Like those of the balsams the needles are flat and soft to the touch but not as wide. We note the chief difference between the

DETAIL OF BALSAM FIR

Note the conspicuous leaf-scars on the branch when a few of the needles are pulled from the stem

Douglas fir and the balsams at the base of the needles, for those of the Douglas fir are not wide at the base. In fact they are distinctly narrowed and when pulled from the twig do not leave the tell-tale round leaf-scar, characteristic of the true firs. Instead the scar is rather inconspicuous and if not partially destroyed by tearing of the delicate bark on the twig will be found to be oblong in outline.

The Douglas fir is a beautifully formed tree, having a broad, loose pyramidal form with numerous long pendant branches hanging from the main branches. It presents a more graceful form than the balsam or true fir—these trees being characterized by a more compact outline and short branches.

Perhaps you wonder why we have not mentioned the cones of these trees. This may seem even stranger when we state that the cones of these trees are very distinct and offer ready means of identification. The reason for this neglect is, of course, that we find cones on trees of Christmas tree size only on rare occasions. However, if your tree does possess these interesting and distinctive features some of the accompanying illustrations will serve to bring to your attention their characteristic appearance.

Among other conifers which occasionally serve for Christmas tree use in some parts of our country are the pines, the redwood and various native "cedars". Their use is greatly restricted, however, because they are not well adapted for this purpose. It must be said further that there are no true cedars growing, as native trees, in the United States. There are numerous trees known as cedar but the true cedars, belonging to the genus *Cedrus,* are native to the Orient, Asia Minor and northern Africa. The cedar of Lebanon, of Biblical fame, is one of these and the Deodar Cedar, which comes from the Orient, has been widely planted in the west, and is often utilized.

So check up on your Christmas tree. Compare it with these descriptions and really get acquainted with this most interesting and fragrant feature of the Yule season.

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It's in the Bag

By R. P. EMERSON

BLUEBIRDS know their own mind. At least this was true of a pair that, early in June, picked as their home a clothes pin bag hanging on a post in a backyard at Villa Nova, Penna. Their first step was to throw out the dozen clothes pins and half fill the bag with hay. The maid, wondering what the children had been up to, reversed the process. The bluebirds, not to be outdone, again threw out the clothes pins and replaced the hay. For three days the battle continued before the maid realized the situation. She then hung the bag on the back porch to discourage them. Even then they proceeded to build their nest, meanwhile giving the family a round scolding.

This determination was too much. The birds won. Back to the post went the bag with the blessing of the entire family, who had just learned of the battle. Soon the nest contained five blue eggs.

The bluebirds strutted in victory. When the children took down the bag to inspect the nest, father and mother bird sat with pride on the telephone wire. They even watched with interest when a photograph was taken from a stepladder with the aid of reflected sunlight. When it was over Father Bluebird sang a most justifiable song of triumph.

Trailing the Woodfolk

By SYBIL L. DANIELS

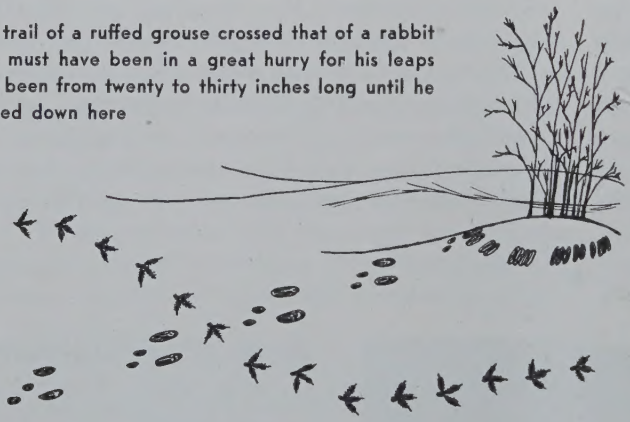
Illustrated by the Author

The larger tracks of a gray squirrel where he had come to a tree

HAVE you ever been trail hunting in the snow? This is a form of hunting that requires no gun or game-bag. Field glasses, pocket notebook, pencil, and a folding rule are the best equipment, for your purpose is not to kill but to learn of the lives of the woodfolk by studying their autobiographies written in the snow.

These stories can be read most easily when a thin blanket of light soft snow is covering the ground. The first snowfall of the season offers some opportunities, but even better may be a later snow that covers the old and crusty drifts for, by that time, the animals will be forced to venture forth in search of food.

All winter I had been watching for just the right conditions at a time, either weekend or vacation, when I could be at my home in the country, not out in the wilderness but in a small village about twenty miles from Boston. Finally my chance came. For four weeks the ground had been covered with more than two feet of snow. Then came a February sleet storm, glazing every-



The trail of a ruffed grouse crossed that of a rabbit who must have been in a great hurry for his leaps had been from twenty to thirty inches long until he slowed down here

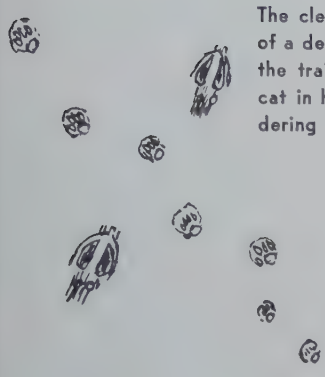
thing exposed to it. During the evening the temperature dropped, the storm changed to snow and then cleared. The woodfolk were given a clean slate on which to record their activities of the night. Dawn broke upon a world made beautiful by the storm. Fairyland seemed to have become a reality with its glassy trees, shrubs and grasses glistening in the sunlight. We had to narrow our eyes against the beauty of our strange surroundings.

I had been glancing at the paper when Hex, the police dog, poked her nose into my hand, whined and looked at me with pleading eyes that seemed to say, "Let's go out." As I went for the leather jacket both Hex and Jerry, her pal, expressed their approval by excitedly prancing around, falling over each other and jumping up on me. Once outside, they watched me with questioning eyes. When I turned toward the street they dashed off ahead, crossed the road, and started down the path into the woods. Their tracks told a merry tale of walking, running, stopping to frolic, and then bounding on again. We had not gone far when our trail was crossed by that of a red squirrel. He must have run along the wall for his tracks seemed to start there. He wandered for several yards to the base of a small tree where he dug a hole through nearly two feet of snow. This effort was rewarded by a couple of acorns, probably a scanty meal for a hungry squirrel. Although these little fellows are more thrifty than the gray squirrel, by this time of the year, especially with so much snow, they must do considerable foraging for food. Since there were no tracks leading away from the hole I concluded that the red squirrel had climbed the tree and taken an arboreal trail. No doubt he and his little brothers found enough for breakfast for there seemed to be many holes where they had dug successfully. I also found the larger tracks of the gray squirrel where he had occasionally come to the ground when trees were too far apart to allow his usual means of travel. Near one partially decayed oak the ground was scattered with acorn shells that must have been discarded from an eating perch above. Had a gray squirrel visited his store of nuts and cast away this debris as he contentedly munched his breakfast?

By this time my dogs were becoming a bit impatient with my loitering and returned to investigate. As I knelt to examine a new track Hex showed her interest by obliterating it with her clumsy paws. Of course, I could have left the dogs at home. I might have found more tracks if I had, but then, there were tracks enough and I just had to share the

We next chanced upon the trail of a skunk and followed him over the wall

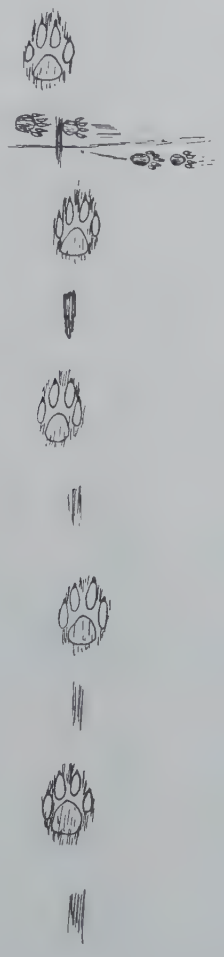
joy of the whole outing with the dogs. They think that's what I come home for. As they played around I heard the whir-r-r-r-r of a grouse that they flushed only a few yards distant and I soon found the imprints of his "snowshoes" showing how he had gone from one squirrel hole to another, just to see if one of his furry friends had



The cleft hoof-prints of a deer crossed by the trail of a house cat in his night wandering

left a scrap of an acorn. I hope he found enough to eat. How fortunate he is to be provided with natural snowshoes for his winter wanderings. His trail was crossed by that of a rabbit who must have been in a great hurry, for his leaps were from twenty to thirty inches long. Near the edge of the woods he had slowed down, and then visited several blueberry bushes along the stone wall, where he stretched himself up and nibbled at the tender growth of the lower twigs. How easily his length could be measured here, not as accurately perhaps as if I had been hunting with a gun, but near enough, for I can find no joy in killing.

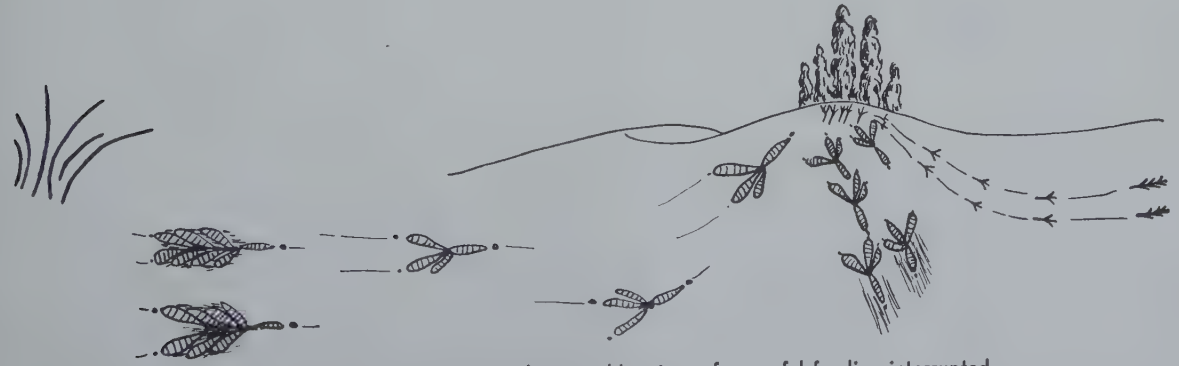
We next chanced upon the trail of a skunk and followed him over the wall into the mowing field. The closeness of the prints showed that he walked leisurely down the field, perhaps because of a scratched toe. It was leaving a bloody trail and may have been bothering him. Part of the way the trail was double, but since the two began and ended in different places there seemed to be nothing to indicate that the animals traveled together. The skunk with the sore paw paused at the corner of the field and then ran down the hill, over the wall into the pasture, circled around and finally disappeared at the edge of the swamp in a brambly thicket of saplings and wild cucumber vines, too dense to penetrate with any ease.



The tracks of the woodchuck and the fox crossed

Following the cushiony prints of cat paws, our expedition headed towards home. Could it be our sleepy pussy who had ventured so far from home? I didn't realize she left the fireside long enough for that. It wasn't really far, though. I could have walked the distance in five minutes, in fact at no time during the entire hike was I out of calling distance of the house—that is, if I were to be called with the cow-bell used for that purpose, an interesting relic picked up on a southern battlefield during the Civil War and brought home by a member of the family. But the bell didn't ring and I didn't go home for I came upon the cleft hoof-prints of a deer. How I wish I might have seen that sleek and graceful creature dart from the woodland across the pasture to the apple orchard. There she went from tree to

They might have been the tracks of a robin although February seems early for them to be with us



The tracks of sparrow and crow told a story of peaceful feeding interrupted by the black intruder and quick flight on the part of the smaller bird

The dainty tracks of the field mouse and deer mouse suggested a night of moonlight dancing

tree, apparently seeking food in spots where the ground was bare and dry grass was in evidence. From the orchard the trail went to the roadside. Could an auto have come along at just the wrong time? The deer crossed and hurried as fast as legs could carry her until she disappeared over the hill. Under a tall pine the snow had been pawed away and some fairly large animal had slept, softly bedded in fragrant pine needles and protected from the cold west wind by a stone wall and the low sweeping branches of the tree. What could it have been? Trails of both deer and fox passed through the place.

In a neighboring pine some bird had found refuge and then hopped down to write his biography on the landscape. He moved in running hops dragging his toes. The marks might have been those of a robin but I am not quite sure. I had seen no robins as yet though they have come in flocks in previous Februaries. Farther down the hillside more tracks were visible. Some small bird, perhaps a sparrow, was hopping around and eating seeds from the steeple bush as it held its spires above the snow. Then a crow, flying above, thought the little fellow was having too much for one and came to join in the feast. The frightened sparrow took a few hurried hops and flew away. Blackie, the crow, tried the seeds and then, in hope of finding something better, strutted back and forth, dragging his nails and leaving clear prints that showed even the sections of the toes. As he flew away he didn't quite clear the ground but left in the snow the print of six primaries of the right wing.

And what do our tracks mean to them?

Thus far we had crossed the two-and-two tracks of a woodchuck several times and decided now to follow them. Curiously enough the print of each forward pair shows four toes and the backward pair five. For half a mile or so we went up hill, down dale, and circled around without getting anywhere. Why had Johnny Chuck taken such funny detours? In some steep places the snow showed where he had skidded on the slippery crust and had to go the longest way round to mount the hill but in other places it seemed as if he must have been dodging his own shadow. Perhaps he thought to tire any followers by leading them a merry chase but we continued to his burrow. In fact, we found two holes, a few rods apart, both of which had been used since the new fall of snow. How many woodchucks had been out? The hillside was a maze of tracks that led north, south, east and west.

Continuing in the direction of the river we discovered the trail of a fox. He was apparently traveling in a very business-like manner toward my home but, not feeling inclined to travel in that direction myself, I decided to backtrack and see where the fox had come from. The dogs enjoyed following his trail, too, and we soon found that he had come from across the river on the ice. We could go no farther because, no matter how cold the weather, the ice over the swiftly-flowing Charles is considered treacherous at this point. We turned toward home, still following the fox trail where he had run along in an easy gait and paused at the vantage points to look around. There was one place in the snow where he must have lain down and rolled. The dogs took it as their cue to do likewise. His trail was straight across fields, among trees, over walls, up the hill, and through the orchard to a place in the pasture where an old horse had been killed and the carcass was serving as food for many wild folk. A flock of crows flew up from there as we approached, but not without having left their footprints upon the snow. We even found where their sentinel had stood till he warned them of our coming.

Who else frequents these regions? From under an old board a field mouse had ventured forth and then scampered back again. Near by were the marks of the white-footed or deer mice, but what had they been doing—holding a dance in the moonlight? The ground was literally peppered with their tracks. Smiling at thoughts of their antics I singled out a more sensible trail and followed it to a discarded tip-cart which has stood right there for years. I thought of the days when, as a youngster, I used to meet the men at the corner and ride in with each teamster as he returned from his day's work, how the tool box under the seat fascinated me and how I liked to rummage through the straps, buckles, tools, ropes and so forth, kept therein. I just wondered if anything of interest had been left in the box on this old cart, and tipped the seat down to see. No, there were no tools, just an old iron bar, but in one corner a mound of fur and straw attracted my attention. I poked a finger gently into the top, moved it aside, and looked into two bright eyes below. At the same moment another little deer mouse ran out of his nest into full view. He was a cunning little fellow with grayish brown head and back, white breast, belly, and feet, snapping brown eyes, and ears that seemed several sizes too large for such a wee animal. He started for his doorway, a hole in the corner of the box but, speaking softly, I persuaded him that I meant no harm and he

finally returned to the nest. What a cozy winter home they have there! I'd like to call again sometime.

Where had the fox gone after his feast of horse meat? That was my next question and I took up his trail again. He poked along the pasture wall to a barway where he stopped, looked, and listened, then continued through the field. When nearing the highway he was startled, or at least headed off, by something—perhaps a passing car—, for he suddenly turned, jumped the wall, and bounded diagonally across the peach orchard. Then, as the sound of the car had died away in the distance he slackened his pace and in his ordinary gait left evenly spaced footprints, frequently joined by the blurry mark of his dragging tail. This characteristic trail led straight toward the house and was easy to follow until it went into the path in our own back yard! The fox trail had brought me home.

I wonder if the animals ever follow and study the tracks we make. What do our tracks mean to them? Are they a cause of fear and worry or are they symbols of help and kindness? I'd like to be recognized as a friend by the woodland folk.

A Builder of Aerial Tunnels

By HOWARD CLEAVES

In the Pine Barrens of New Jersey we were strolling along one of those delightful old roads, etched below the level of the surrounding country by generations of horse-drawn rigs, when we noticed a grayish tube, about a quarter of an inch in diameter, extending from the shoulder of the low cutbank at the edge of the road to the twigs of a dwarf huckleberry, a height of approximately three inches. To the touch the tube was elastic and frail, suggesting a limp silk stocking hung from a line. The gray color, we found, was imparted by a coating of the barrens sand, which appears white, light blue or gray according to varying conditions of light and moisture. The tube itself was much like closely-spun cobweb. As for the coating of sand, one of our party suggested it had been blown there by the wind, but closer examination showed it to be laid on with the uniformity of sand on sandpaper. Wind could hardly do so even a job.

THE STRANGE CATERPILLAR TUNNEL
A drawing by Muriel Mattocks Cleaves showing the tunnel about three-eighths natural size

A little farther along the road we discovered two more of the tubes, one being the prize exhibit shown in the sketch. This one had an extension line of tubing running a distance of nine inches from one bush to another. We now felt no hesitation in sacrificing one of the exhibits on the altar of our curiosity. Excavating carefully, we found a drab, dirty-white, naked caterpillar with black head. It was in a chamber three or four inches below the surface of the sand at the lower end of a web-lined shaft connecting with the visible tube above ground. In the compartment with the inch-long caterpillar were castings indicating that the tenant had retired to his quarters after eating, and had remained there for probably a considerable period. In the third of the three examples we observed that not a leaf remained on the first huckleberry plant to which the aerial tunnel was attached, and that there were two tubes leading to the ground.

In making discoveries outside of one's own special field it is advisable to tread lightly. Inquiry among entomological friends disclosed that, while our new acquaintance was not an out-and-out rarity, we had nevertheless stumbled upon a rather uncommon and probably little-known insect. In its adult form it is a cream, brown and bronze moth about an inch long, known as *Prionapterix nebulifera.* An account of it is given in *Entomological News* for January 1905 by Erich Daecke of Philadelphia. Mr. Daecke kept *Prionapterix* captive and observed some of his ways. Among other things he records that the caterpillar never showed itself; that the tube or hose was always built around a leaf before the leaf was eaten; that the tube was extended at the rate of between one and two inches per day; and—perhaps most striking—that when food was exhausted on one bush the aerial tunnel was projected in the direction of a fresh plant with uncanny precision, although, by the nature of the situation, the caterpillar could not see where he was going. The account does not explain how the sand gets on the outside of the tube. Our experience was on June 23. Mr. Daecke's specimen emerged as a moth on June 26.

Imagine a farmer, desiring to pick apples, doing so by constructing a canvas chute from his house to the orchard, then extending the contraption from one tree to another, creeping back through the tube to the cellar of his home with his apples, never once exposing any part of his anatomy to his neighbors or to passersby. That would be roughly the human counterpart of what *Prionapterix* does while in the caterpillar stage. Which makes me wonder sometimes if the entomologists, after all, do not pursue the most fascinating of all callings.

Partridge-Berry—Plant of Christmas Cheer

By S. JUDSON EWER

PARTRIDGE-BERRY IN FRUIT
The berries are half hidden among the leaves, each displaying its two "eyes"

UPON a drab November day when the colorful autumn leaves that so recently lighted the woodland with gold and orange and red lie in heaps upon the forest floor or swirl over the hillsides in the chill wind, we make our annual excursion for the partridge-berry without which our homes would lack a certain sprightly brightness during the winter season. We search for the more open places of the forest, where perhaps some giant tree, unable to withstand longer the onslaughts of the winter winds, has fallen, allowing the sunlight to penetrate; or where a few smaller trees have been cut here and there, thus creating a little clearing upon a slope among the pines and hemlocks. It is in some such spot that vines of the partridge-berry trail over the ground, and the oval or roundish, dark green leaves form a thick mosaic studded with bright red fruits.

The partridge-berry or "Indian tea-berry" is technically known as *Mitchella,* thus named in 1753 by the great Swedish botanist, Linnaeus, in honor of his correspondent, Dr. John Mitchell of Virginia. There are only two species of *Mitchella: M. repens* (*repens* signifying "creeping") of our American woodlands that has a range extending from Nova Scotia to Florida and westward to Minnesota, Arkansas and Texas; and a species native to Japan. In our northern woods the common name partridge-berry is the usual appellation and doubtless derives its origin from the fact that the ruffed grouse, or partridge, eats the edible, but insipid, red berries, sometimes scratching for them in winter upon exposed banks where the snow cover is thin. The plant is also known as the deer-berry, fox-berry, pigeon-berry, two-eyed or one-berry, and squaw plum. Thoreau was attracted by the fact that the leaves, which are at times whitish veined, checkered the ground, and he, therefore, wished to call it the "checker-berry". The latter name, however, is that ordinarily applied to the common wintergreen, *Gaultheria procumbens,* and its use for the partridge-berry would be more confusing than helpful. Exactly the same reasoning bars the name "Tea-berry".

It is difficult to conceive of any wild plant possessing more grace or beauty than does the partridge-berry. At all seasons of the year it displays an equal delicacy and charm. In the early spring, when the snow first melts from the hillsides and woods, one finds the vines fresh and green, or even gay with a few bright berries that have survived the winter and the visits of hungry birds.

In late June or early July (sometimes even as early as April in the southern states) the blossoms appear, and from among the dark green leaves the fuzzy white flowers, always in pairs, are lifted to the light and give to the air of the woodland a delicate, soft fragrance—a wild incense to the god of the wood! Thoreau has peculiarly described the odor as being "agreeable and refreshing, between the mayflower and rum cheery bark, or like peach-stone meats".

The flower has a tubular corolla, the tube being about a quarter of an inch long, and opening at the mouth into four (usually) flaring petal lobes that are densely white and hairy within. The buds are purplish before opening. Within each flower are four stamens attached to the corolla tube, and in the center arises a single style with four linear stigmas. Either the style or anthers may be exserted beyond the limit of the corolla. The flowers are always found in pairs (sometimes they are fused) and at their bases the two inferior ovaries are closely united so that the berry or fruit (really two tiny fused drupelets or stone fruits) develops from the two flowers. It bears at the apex two little pits, like tiny "eyes", that are surrounded by the persistent calyx points; hence the origin of the name "two-eyed or one-berry". The plant belongs to the Madder family, and is related to the bedstraws, buttonbush and bluets.

What an unforgettable experience it is to enter the cool shadows of a woodland, where ferns abound, pyrolas send up racemes of sweet-scented flowers, and the ground-

PARTRIDGE-BERRY IN BLOOM
Here Mitchella repens is found blooming among the pigeon-wheat moss plants

pine, *Lycopodium,* trails shiny green branches, there to see the ground starred with the fragrant white blossoms of the partridge-berry. In the trees above one catches the quick flutter of a hermit thrush and the ethereal flute-like notes of his song make vocal the vesper hour of woodland twilight.

It is not in the summer, however, that the partridge-berry brings its greatest message of good cheer to the hearts of mankind. Many people, harbored in the centers of our great cities, have rarely the opportunity to walk woodland paths or to scent the soft fragrance arising from the starry mat that trails upon the forest floor. Some can never hope to enjoy this experience. But in the autumn the partridge-berry may go to them and make their hearts gay with its red and green. If we who may get to the plants in their wild haunts will but go there in the late autumn and snip carefully the ends of the creeping stems bearing the bright red berries, a lasting box of Christmas cheer may be sent to our friends in the city or to those confined indoors by illness. Pack a little moss about the cut stem ends, include a few tiny ferns and other bits of woodland greenery, and give the following instructions:

To Make A Bowl of Good Cheer!

Place in the bottom of a clear glass bowl a few pieces of charcoal and cover with moss; tuck the tiny ferns and other bits of green among the moss; distribute the stems of partridge-berry here and there, being sure that the cut ends are placed downward into the moss; add a little water, just enough to moisten; cover the bowl with a piece of glass.

A Merry Christmas and A Happy New Year!

In such a little "winter garden" the berries will retain their cheery color, and the vines will even send out roots and begin to grow; the ferns will unfold tiny new fronds, and the moss will keep its fresh greenness. Throughout the snowy months there will be the cheer of wild things—of growing wild things. If, in the spring, some shaded plot of earth is available where the soil is somewhat acid, the plants may be taken from the bowl and set in the ground to continue their growth there.

If any one who has the space and opportunity for a garden does not have the partridge-berry growing wild upon his property he should remedy the matter at once and be sure to plant some at the first opportunity. The plants are offered for sale by wildflower dealers and cultivation in secluded spots is not difficult. The beauty of the vines at all seasons will well repay all efforts to establish them.

A word of caution only need be added concerning the gathering of the partridge-berry, either in the wild or from the patch growing in the garden. In this day of conservation when it seems that every wild thing has to receive a certain amount of human protection in order to survive, it behooves us to collect with discretion. When plucking the partridge-berry take but a few stems, each with its brilliant berry. It is neither desirable nor necessary that the berry-bowl be filled to overflowing; a few stems, placed judiciously amid plenty of moss and a few small ferns or other little green things, are just as beautiful and far more artistic than a bowl crowded and stuffed until there is neither opportunity for the circulation of air nor for the growth of the plants. When picking, snip carefully with a knife or scissors, and do not pull up the plants by the roots. The roots are not necessary for the bowl. New roots will be produced adventitiously from the joints of the stems in the humid, warm atmosphere within the jar. Thus, if care is used, there will be no need to fear for the extermination of this woodland plant, and another year the fragrant white flowers will grace the forest banks, and another autumn there will be plenty of red berries to enhance the beauty of both our own tables and those of our friends throughout the winter season.

Next month we will present another fascinating story by John Lindsey Blackford, a companion article to that which leads this issue. We confidently predict that Mr. Blackford is going far as a Nature writer.

The Roc of Ages

By WILLY LEY

THE STORY of the giant Roc, or, more precisely, Rukh, is most widely known from the *Arabian Nights,* where Sindbad, the Sailor, tells us:

"The close of the day, and the settling of the sun, had now drawn near; and behold, the sun was hidden, and the sky became dark, and the sun was veiled from me. I therefore imagined that a cloud had come over it; but this was in the season of summer, so I wondered and raised my head, and, contemplating that object attentively, I saw that it was a bird, of enormous size, bulky body, and wide wings, flying in the air; and this was that concealed the body of the sun, and veiled it from view upon the island. At this my wonder increased, and I remembered a story which travellers and voyagers had told me long before, that there is, in certain of the islands, a bird of enormous size, called the Roc, that feedeth its young ones with elephants. I was convinced, therefore, that the large white dome which I had seen was one of the eggs of the Roc. I wondered at the works of God (whose name be exalted!); and while I was in this state, that bird alighted upon that dome, and brooded over it with its wings stretching out its legs behind upon the ground; and it slept over it. . . ."

AN ARTIST RECONSTRUCTS THE ROC

Well known to crossword puzzle fans, it was credited with being able to carry elephants in its talons

This fabulous bird is not only to be found in the *Arabian Nights;* there are other old books that tell about the Roc, and, though it seems extraordinary, they all agree in the chief features. They agree that it was a bird of enormous size, that it fed its young with elephants, that it looked like an eagle and that it had its home "on certain southern islands". The islands are never named; obviously they had no names. We find the same story in Persian hero-tales, the name of the Roc is here "simurgh". We find the Roc in Arabic manuscripts and even in the books of the Venetian, Marco Polo, the first white man since the days of the ancients who had travelled all over Asia.

Marco Polo was considered by his contemporaries to be the greatest liar in the world, because he told about cities in the Far East with a million inhabitants and more. "Messer Millione", he was called—Master Million. Later it was found that these cities existed.

The question is now, incredible as it may seem, whether Marco Polo was right about his Roc, too. He claimed Madagascar to be the island of the Roc. And there is something that possibly gives evidence of truth to his talk, although the full-sized Roc of the *Arabian Nights* must, of course, have been a phantasy.

Madagascar was the home of the largest bird that ever lived in the present or the past, the Aepyornis. This was a giant, ostrich-like creature, its ugly head towering twelve to thirteen feet above the ground. It produced the largest eggs ever laid by a bird—as large as half a dozen ostrich eggs together. These eggs are still found in the jungles of Madagascar, although the Aepyornis itself is now extinct. The last record of it is a passage in the book of a French traveller, Gaston de Flacourt, written around 1650 and stating that these birds lived then in the densest parts of the jungle of Madagascar and that it was very difficult and dangerous to hunt them.

It is likely that the gigantic eggs of the Aepyornis were considered, in earlier times, to be the eggs of the Roc; but the story of the Roc itself must have had another origin, for the Aepyornis could not fly.

The gigantic size of the Roc and the story that he caught and carried elephants seemingly was nonsense. Sometimes "Roc feathers" were brought home from Madagascar by travellers—a swindle, for they proved to be fronds of the Raphia palm, looking, when dried, somewhat like feathers of a gigantic bird. The largest flying animal that ever lived was the flying reptile *Pteranodon,* found in the cretaceous layers of North America, but its wings from tip to tip measured only twenty four feet—large enough, perhaps, to carry a calf (there were no cows in the days of the *Pteranodon*) but not an elephant. Moreover the *Pteranodon* became extinct about fifty million years ago. Men surely did not know anything about it before the fossils were found and reconstructed by the paleontologists.

But two British scientists, Dr. Lydekker and Dr. Lambrecht, both geologists and paleontologists, made a few discoveries enabling them to find a theory that probably solves the riddle.

In the midst of the Mediterranean, in a position of highly strategic importance and therefore the military goal of several different European nations, lies the small rocky island of Malta. Paleontologists have there found large deposits of fossil bones, comparatively young deposits, geologically speaking. (Continued on page 375)

The Nature Picture of the Month

There is splendid action as well as fine photographic composition in the photograph selected this month for special award. It is the work of Storrs H. Lyman of Dayton, Washington. Resenting the intrusion of the photographer, one of the pair of young longeared owls angrily spreads its plumage and snaps its bill. The other appears to leave the belligerence to its nest-mate and watches the proceedings with calm; in fact, it seems to be slightly surprised at the antics of its companion. Mr. Lyman obtained this picture with a Graflex camera.

The editors of Nature Magazine have been amazed at the excellence and variety of Nature pictures obtained by amateur photographers all over the country. It is apparent that many alert camera-hunters are constantly prepared for the unusual shot, or possess the patience and ingenuity necessary to make their opportunities. Other outstanding photographs submitted to the Rotogravure Editor are published elsewhere in this section.

The editors are now confronted with the task of selecting the outstanding pictures for use in the Rotogravure Sections in the issues of February, March, April and May, the last date for receiving entries for this series being November 1. Photographs may now be submitted for the issues from June to next September, inclusive.

Those fortunate people who enjoy the leisure, and whose pocketbooks permit them a winter vacation, may seek some climate where snow glistens in the sunlight, or where the sand of the beach sparkles in the tropic warmth of a southern climate. The Swiss Alps or Hawaii's Pacific islands offer such a contrast in distance and temperature. But wherever the vacationist may be he will find that it is Nature who is his real benefactor; Nature who endows this region or that with its particular beauty and charm.

In one of her many moods Nature is an artist in ice and snow, working with crystals as a medium and defying man to match her. Whether it be the soft and clinging white tinsel with which she adorns the bare branches of a tree, or the feathery designs of flowers and ferns that she paints upon the surface of the frozen lake, she leaves man dazzled with her art.

In these two winter pictures from St. Moritz, Switzerland, the photographer, Albert Steiner, has recorded this artistry on the film of his camera.

If the winter vacationist happens to prefer the soft breezes of summer, he may take ship—or plane, perhaps—for Hawaii, which, all residents freely admit, is the Paradise of the Pacific. The Islands are rich in assets of Nature interest, their comparative youth, geologically, making them particularly interesting to study.

At Kalapana, Hawaii, for example, the visitor finds a strange-appearing beach, the sands of which are black. This is due to the fact that this sand is ground-up lava. Nearby this beach is a village where native Hawaiians live more nearly as did their fathers than in most places on the Islands. Photograph courtesy of the Hawaii Tourist Bureau.

One of the products of Hawaii is the papaya, the breakfast "melon" of the visitor, who may go out and pluck one should he desire. In fact many residents grow their own and have only to go out in the backyard to harvest it. A paste is being manufactured from this fruit and finding favor as salad dressing or as sandwich spread. Photograph courtesy of the Pan-Pacific Press Bureau.

Turkey Vultures

W. Bryant Tyrrell, who gave us the picture story of the eagle family last July, has been spying on the home life of some turkey vultures, and here we see what he found.

We usually think of a turkey vulture, or turkey buzzard, as a vicious bird, fearing nothing and always ready for a battle. In fact, however, they are docile and afraid, shun rather than seek battle, and protect themselves from their enemies largely by the offensive odor of disgorged food. On the wing they are graceful and tireless.

One December day, while bird-studying with a group of Boy Scouts, Mr. Tyrrell came upon a winter roost where 147 birds were counted. The following April he returned to find a nest partly shadowed by a fallen log. On May 21 he found that the two eggs had hatched and a pair of three- or four-day-old buzzards posed awkwardly on their sheltering log.

"As we came near the nest," Mr. Tyrrell says of this event, "we saw the old bird on the nest, her head under the log. We stealthily approached without disturbing her until we were so close that we thought she must be sick. From the odor one might have been convinced of it. Cautiously getting closer and closer, I was able finally to lift her from the nest to band her. She made no sound, nor did she strug-

gle, her body lying limp in my hands. Finding that the bands were too small, we released her and she went immediately to her nest and covered her downy babies. Several times we took her from the nest and released her further and further away. Each time she returned to her young.

"We wanted to get pictures of the youngsters and finally got the mother to go away by setting her on the log above so she could not see her nestlings. She flew off and circled above while we got out the babies. They were helpless little creatures, just bundles of white down, unable to hold their heads up for long, or to stand. In size they were not as big as one's fist, with the face, bill, front of the neck and the crop a bluish black. The legs and feet were a dirty gray.

"Two weeks elapsed before our next visit. The young had trebled in size but otherwise had changed little except that the large wing feathers were beginning to show, each with down still adhering to the tip. They hissed like escaping steam while we were near them. They and the nest were clean, but when we handled them to bring them out for photographing they disgorged material with an odor that surpassed anything in my experience. We banded them, snapped some pictures and departed as quickly as possible. Our craving for their companionship was satisfied.

"We next visited the birds on the Fourth of July. On reaching the nest we found that the young birds had changed considerably. The down on the back was giving way to the feathers of the wings. The tail feathers were growing rapidly. The birds were now in what might be called the transition stage, with still considerable down on the neck and underparts.

"Two weeks passed before we again made our way along the nettle-bordered path to the nest area. We were delighted to find that the young were still there. Both birds were standing on the nest log as we came up. Funny looking birds they were, with their dark backs, downy necks and underparts, and black faces. They were now beginning to take on the appearance of the adults, and although still unable to fly, they used their wings as they ran to hide under a nearby log, trying to

get away from us. It was remarkable how easily so large a bird could become invisible among the foliage.

"When we approached the nest area one week later —July 25—both young were near the nest, but one managed to get out of sight among the roots of an upturned tree, and was not found until we were nearly ready to leave. One still had considerable down on the neck, breast, and belly, but the other had only a collar of down. The one that had hid as we came up was the more active. They would soon be on the wing, for one managed to fly about twenty feet, with several wing flappings, after a vigorous spring in the air.

"On our way out, as was our usual custom, we stopped on a bar in the river to wash our hands of any objectionable odors, or poison ivy with which we might have come in contact, for the woods was full of it. At our feet in the soft, moist sand were muskrat and opossum tracks. A wood-thrush sang from one of the trees bordering the stream, a chickadee called, and high above in the blue vault of the heavens two buzzards were lazily circling. Continuing along the nettle-bordered, ivy-hung path through the quiet woods, we realized that our trips of 'buzzing the buzzards' as 'Mac' called them, had come to an end."

Children of the Desert

Photographs by Wright M. Pierce

Cactuses are, of course, synonymous with the Mohave and Colorado Deserts of California. Unfortunately, however, these characteristic and fascinating children of the desert places are much less common than formerly, having been ruthlessly torn up by dealers in cactuses or by individuals who want them for their gardens and have no concern that the desert shall continue to bloom with its characteristic and bizarre plants.

As it is, one is indeed fortunate to be able to see a barren desert hillside covered with the strange grizzly bear cactus, looking at a distance like welcome patches of snow in a hot and dry country. Growing in apparently most inhospitable soil it was formerly most abundant in sections of the high Mohave Desert.

Another beautiful product of the desert is the smoke tree. It is aptly named for at a distance the filmy gray foliage has the soft look of smoke. They grow in extremely dry washes, their roots going deep into the dry soil in search of moisture. In the spring they are virtually covered with masses of dark blue blossoms. These, however, do not invite the picker because Nature has provided the tree with sharp thorns. If Nature had anticipated the thoughtless flower gatherer, and what was to happen to many of her wild flowers and flowering shrubs at his hands, she might have provided many more of them with similar protection.

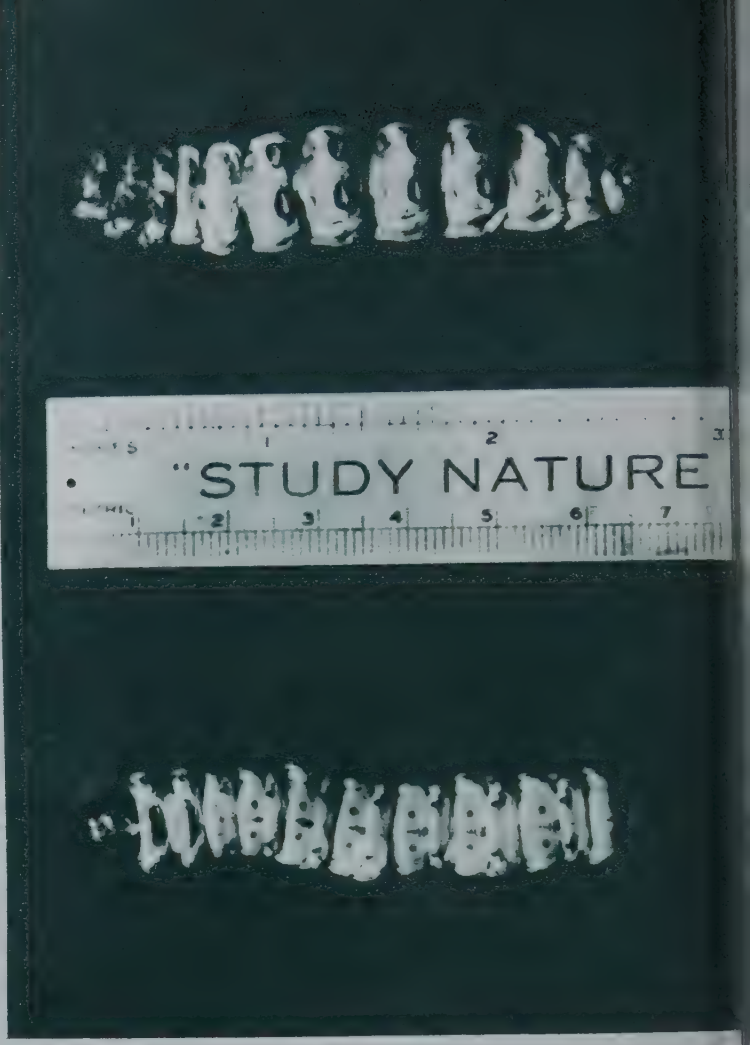
THE SMOKE TREE OF THE COLORADO DESERT
A masterpiece of photography of one of the
desert's many lovely children

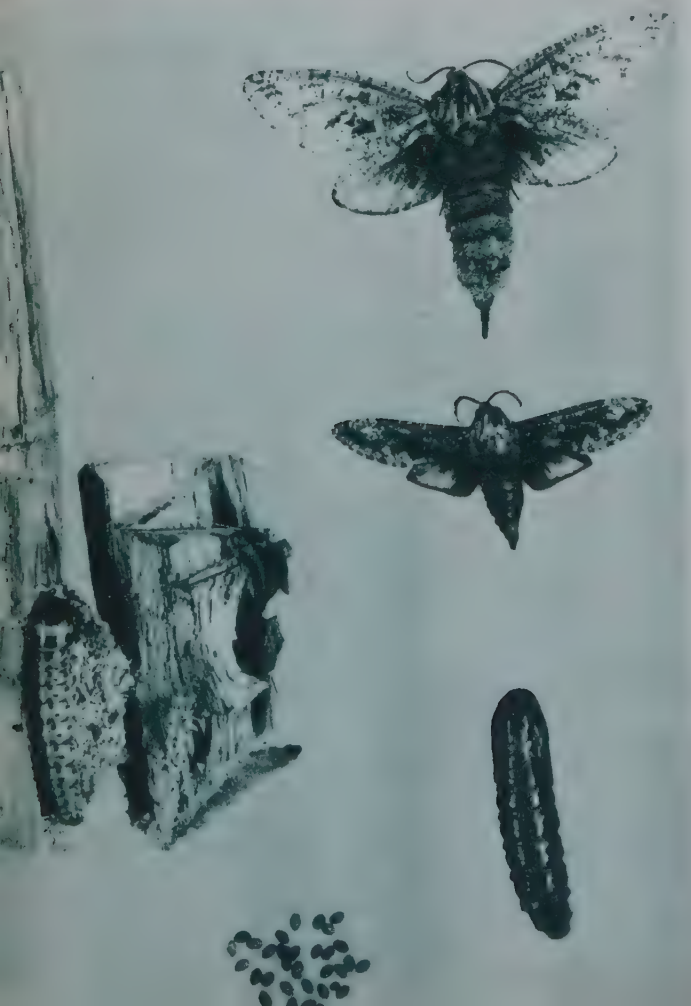
When the desert blooms there is a rare beauty about it because it seems so unexpected. One of the most common flowers of the Colorado and Mohave Deserts of California is the desert primrose, a perennial that loves the sand flats and sandy slopes and hills. Its large, white, waxy blossoms with soft greenish-yellow centers seem reluctant to close even with the coming of the hot desert sun. When they open in the evening it is with a bouquet of delicate fragrance. During the heat of the day the flowers are a shrivelled, red-hued mass. During dry years the primrose plants are dwarfed in size, but in years of bountiful rain may grow into shrubs three feet high. Night moths flutter from blossom to blossom and butterflies flit about the plants in the bright early mornings before the petals yield to the burning sun and take their siesta.

Many are the lizards of the desert; swift, elusive and fascinating. One of these is the leopard lizard of the Mohave Desert, obviously drawing his popular name from his multitude of spots. He is here shown about natural size, including his tail.

The Costa hummingbird, another desert child, builds its tiny home in the thorny cactus and there rears its thorn-conscious offspring in comparative safety.

THE COSTA HUMMINGBIRD





A Larvae Carpenter

Photographs by Adrian C. Fox

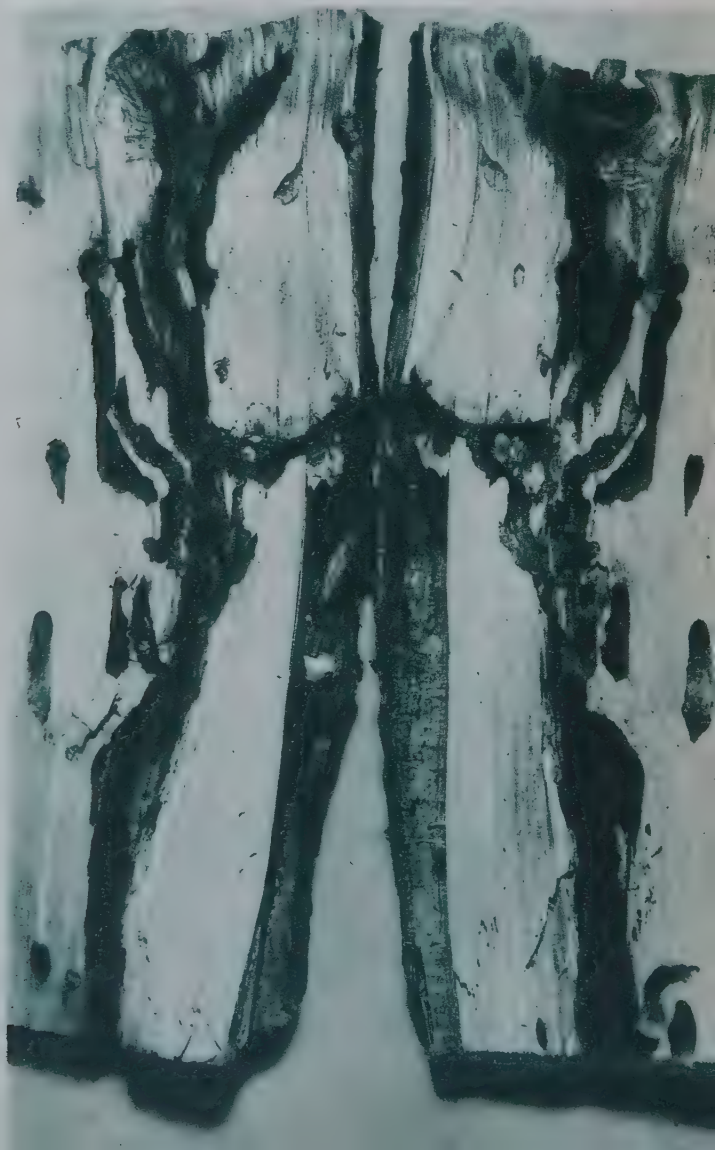
After spending about three years busily engaged in eating up the wood of the locust, ash, maple, poplar, oak, chestnut, elm or peach, the larva of the carpenter moth, known to entomologists as ***Prionoxystus robiniæ,*** spins itself a loose cocoon in the burrow it has made and goes to sleep after the manner of insect larvae. The dorsal and ventral views shown in connection with a ruler were taken just before pupation.

From the cocoon there emerges a moth, gray in general color with black lines and spots. As it clings to the bark of the tree it is remarkably protected against the bird out foraging for food.

The picture at the left shows the complete life cycle of this moth, including the eggs, larva, pupa and adult moth. The smaller of the two moths shown is the male.

Insect damage takes a large annual toll from our forest and shade trees and the part of the carpenter moth in this may be gathered from the picture of the exterior damage done. Such places are frequently covered by bark, which allows the larva to feed on the succulent cambium layer unmolested. The larvae seal the occupied burrows with trash except during the early evening hours when they emerge to feed and dump accumulated debris from the tunnel. These entrances may be seen in the illustration.

If the larva does damage to the exterior of the tree, its depredations within it are even worse. Many a tree, seemingly sound externally, reveals some such condition as this when it is felled and split. The section of green ash shows the tunnelling characteristic of this insect.



K. D. Swan of Missoula, Montana, who won the award for the Nature Picture of the Month in October, also submitted the picture of the lovely and elusive Kaibab squirrel. This little fellow, with his white tail and pert ear tufts, is limited in his range to the Kaibab Plateau of northern Arizona and is a most difficult fellow to catch with a camera.

Although the pet saw-whet owl that Raymond S. Deck of Pelham, New York, has photographed seems to prefer the dictionary as a perch, we are inclined to gather from his knowing wink that he knows the contents of other books.

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Here are two more pictures adjudged as worthy of award by the Rotogravure Editor.

While an aquarium is a subject that stands still while being photographed, its contents do not. To be sure, they cannot run or fly away, but a good aquarium picture calls for more than the average photographic ability. Light must be properly arranged so that the inhabitants of the aquarium and the vegetation both show to the best advantage and the lens and film must be quick to catch the darting fish. Maude Heaton of Cooperstown, New York, has achieved an outstanding aquarium picture.

While there may be a confusion of branches in the picture of the plumbeous gnatcatcher feeding her young in the nest in a palo verde tree, Harry and Ruth Crockett of Phoenix, Arizona, have made a beautifully artistic picture of this event.

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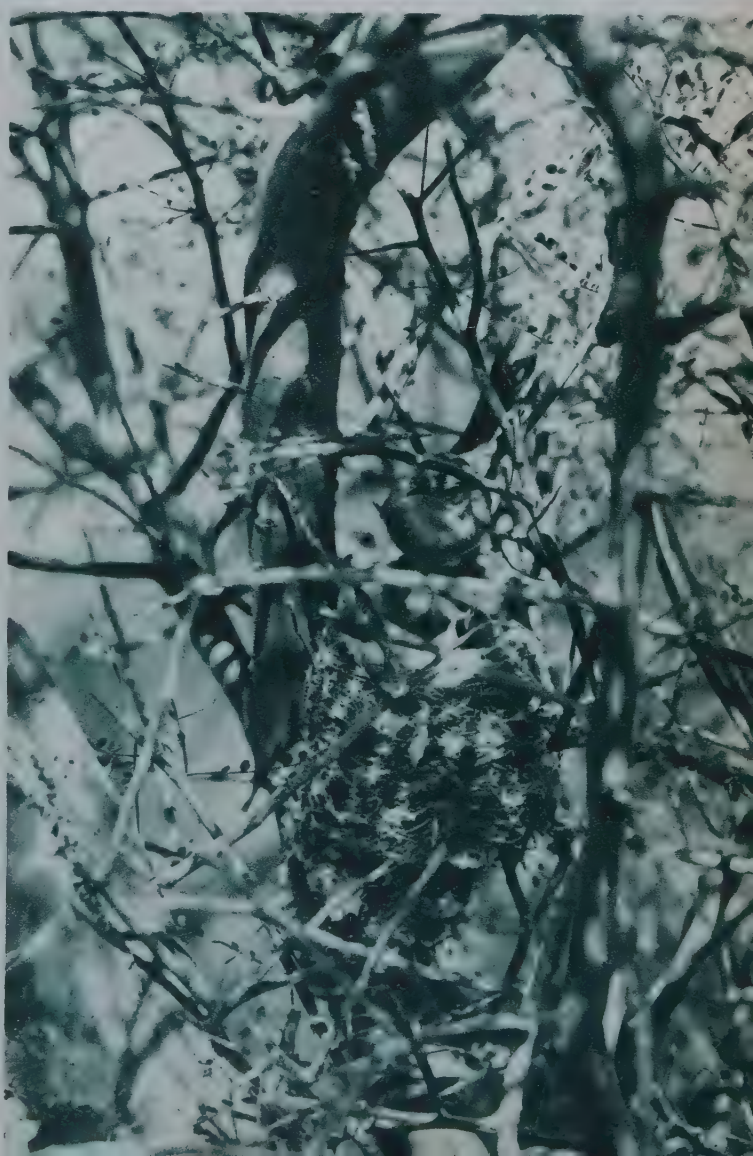


One of the loveliest of our woods flowers and one that has suffered much at the hands of the thoughtless gatherer, the bloodroot, is here beautifully pictured by William H. Bard of Mount Vernon, New York. This wild flower is one of those needing protection and should not be picked.

★ Conservation ★

A section of Nature Magazine devoted each month to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.

ARTHUR NEWTON PACK, *Editor*

LOGIC AND ★ CONSERVATION

We often wonder why man is so prone to ignore simple logic and common sense in ordering his life and activities. This wonder increases when we observe man—in quantity—concerned with the affairs of government. In the individual this propensity may be attributed to our inherent frailties of mind and method. But in government it would seem that the combination of minds might produce better results.

We have expressed before, in these pages, our conviction that there must be a closer and more logical coordination of those governmental agencies concerned with our renewable natural resources. Water, soil, forests, wildlife and our common recreational areas are so interdependent that the present hit-or-miss distribution of administration would be laughable were it not so sad. It is much like an actor playing Romeo in one theater opposite an actress playing Juliet in a playhouse two blocks away.

Graphic evidence of the confused, costly and senseless situation has recently been supplied by Jay N. Darling, Chief of the Bureau of Biological Survey. In articles in two magazines of wide national circulation, Mr. Darling describes the experience of being bounced around from official to official in an endeavor to accomplish something. Precedent, jealousies and myopic selfishness were encountered. Narrowness of vision and complete disinterest in the broad question of conservation of natural resources were common. These conditions Mr. Darling describes with a sense of bafflement, and yet with enough humor to bring them forcefully to the attention of the public.

It seems to us that the fundamental solution is both simple and logical. Every government function with respect to renewable natural resources should be brought together in one place in the governmental structure, most logically, we believe, in the Department of Agriculture. Thus gathered, and provided with a comprehensive program and proper liaison and education between individual bureaus, much of the present costly pulling and hauling would inevitably be eliminated. The chief opposition to such sensible change comes from office holders themselves. They fear that some petty power or privilege in spending the people's money would be taken away. It is up to the people of the United States to demand that simple logic be applied to the administration and conservation of their natural resources.

MUNITIONS AND ★★★ HUNTING

A part of the story of the relationship between the munitions industry and the hunting industry is told by H. C. Engelbrecht in the *American Spectator* for October. Next to war, hunting brings the greatest share of the gun-makers' money. Of the hunters' annual expenditures—about $300,000,000—forty millions are spent for guns and shells. This, of course, leaves a lot for the other beneficiaries of sport. But the gun-makers' share is a tidy sum.

All hunting, since first firearms were invented, has enriched the gun-makers, but it was not until about 1900, when game began to get alarmingly scarce, that the manufacturers got their business of money-making really organized. Soon they had their own conservation organizations, and these have continued. Their brand of conservation mainly involves the opposition of restrictions, and finding new creatures to shoot at. Their technique includes the influencing of State Legislatures and even Federal procedure.

Here the author hits only the high spots, and not all of them. He lists the membership of the Sporting Arms and Ammunition Manufacturers Institute, and names a few of its affiliations, accomplished and attempted. However, he does not mention that the Institute hired experts to find out why game birds had decreased, and then ignored their findings. If those in authority had followed the advice of one of these experts, waterfowl killing would have been outlawed this year. But that would have hurt business!

The gun-makers' institute list, somehow, reminds us of the membership of the newly established American Wild Life Institute; and of the personnel present at Congressional hearings on conservation matters. In fact, some of the paragraphs quoted, and most pertinently allocated, are from the printed reports of such hearings.

All of this makes us sigh for the good old days of our youth, when we believed everything, especially those things that sounded good. Can it be that they might not all have been true? Is it only that we are getting old, and wiser and sadder? Is it possible that, even today, some people do not mean what they say?

SAVING OR SHOOTING ★ ★ ★

"Approved by the Board" is the title given to the accompanying picture by Leslie Thrasher that appeared in color on the cover of a recent issue of *This Week,* Sunday magazine of the New York *Herald Tribune* and other Sunday newspapers. It is a picture with a decided appeal. It has undoubtedly brought spoken or silent responses from thousands who have seen it because affection for wildlife is an inherent quality of the majority of us.

On the other hand, many, who would rather shoot the "Board" gathered around the young sign-painter, will snort: "Sentimentalism." This is the favorite retort of those who regard wildlife only as something to shoot when it is suggested that birds and mammals should be protected for themselves instead of for their use as targets.

And there is another thought suggested by Mr. Thrasher's picture. It is the claim of the licensed hunter that the game belongs to him and to him alone. Here is a young man who thinks differently, and he represents a far greater number of people, unorganized though they may be, than does the hunter. It is up to these millions to claim their rights to what little remains of our wildlife resources.

FORTY MILLION WILD DUCKS ★

In forecasting what is characterized as the "greatest migration in six years," More Game Birds Foundation announces some of the results of its investigation of the waterfowl population in the "Prairie States and Provinces and the remote Northwest Territories of Canada." To many of us this announcement is chiefly notable because it indicates a slow-dawning recognition on the part of the destroyers that an important proportion of the supply of waterfowl comes from northern Canada. The usual attitude has been that the Almighty, having always provided a plenteous supply of waterfowl ready-made beneath the muzzles of the guns of the favored states, was in honor bound to continue to do so.

We are told that five airplanes flew more than 12,000 miles, and penetrated as far north as Great Slave Lake, and that thousands of square miles of productive duck nurseries were observed. Since these airplane passengers had never before visited the region, everything encountered was greeted as a discovery. But, however new and strange the newcomers may have considered these ideal breeding places, they were merely seeing what has been known to thousands from the writings of Hearne and Mackenzie, who first visited the region a hundred and fifty years ago, and from the later explorations of Franklin and Richardson, Back, Kennicott, MacFarlane, and Petitot. Others, who have a background of thirty years or more to aid them in the evaluation of present conditions, point out that the waterfowl populations, however they may impress the present "discoverers", are not one-tenth the number that could be supported by the resources of the waterfowl paradise now just "discovered".

But let us assume that 40,000,000 waterfowl *will* come down from the north and the cultivated, drained, and drought-stricken western plains. What of it? Are ducks and geese needed only for this year, or are they needed for the future? Suppose 12,000,000 (the estimated kill) are bagged this fall; another 12,000,000 (or even half that number) are crippled and lost; and a reasonable proportion die from natural causes; how many will be left next spring for each of the 700,000 waterfowl hunters? And how about the rest of us? After all, when all the thousands and millions of gunners, hunters, sportsmen, gun-makers, hardware dealers and game-bootleggers are deducted from our total population, there are left about a hundred million people who may justly claim a share in the waterfowl that will remain alive next spring. It looks to us that our share will be a very small fragment of one duck, and no goose at all. No, forty million ducks and geese are not enough to brag about, unless one is thinking about them as merely affording targets for this year. But, carefully protected, forty million birds might be built up to a reasonable proportion.

So we are wondering just what is the purpose of these studies and conclusions of More Game Birds Foundation.

Sport Control

By STEPHEN HAWEIS

Love of Nature is an evidence of civilization; it is hardly found among savages or primitive people at all. It is the most modern of all virtues and refinements. Its morality is unimpeachable for it is concerned with truth in opposition to sentiment and superstition. While there were among the ancients individuals who were attracted to the study of the creatures and plants around them, they were always an inconsiderable minority. The ancient world at its best was little concerned with animals, their lives, loves or sufferings. Christianity has not much to say about our duty towards animals and we may wonder why, for surely the dogs and donkeys of Jerusalem were no better treated two thousand years ago than they are today. For two thousand years the simple supposition that animals were created solely for our use has gone almost unchallenged. Natural History hardly became a matter of serious study until the Victorian era.

The earliest printed natural history books reveal how little was known of the animal creation. Until Gilbert White wrote his *Natural History of Selborne* and the Reverend J. G. Wood dilated upon the *Common Objects of the Country and Seashore,* natural history books, with few exceptions, were more like moral handbooks, which told how the cow was given us to provide breakfast for good children, and the lion a sad example of how the babe should not behave—before company at least. And how times have changed since William Blake wrote his sympathetic poem "To a Fly", and good children were exhorted not to kill the pretty things which danced their little hour in God's sunlight so happily! Now we organize "swat the fly" campaigns, for we know, but only since Pasteur's time, that the fly walks in unclean places and does not wipe its feet enough before it settles on baby's milk bottle. And, even now, we provide these unclean places.

It took us many, many centuries to develop a Society for the Prevention of Cruelty to Animals, and even now kindness to animals is considered by many an unimportant by-product of civilized education. What is our duty towards our neighbor on four feet? How should we regard our little brother in fur or feathers? There still exist human beings who are amused by the antic struggles of a tortured animal—they're only animals; what does it matter? There are still men who feel much the same way about savages. At the same time there is hardly an educated man in this country who would not vigorously oppose the maltreatment of any animal he saw being mistreated, although the same man will cheerfully take his gun when the season opens for sport. Is it right to kill one thing and wrong to kill another? And yet, is it quite a healthy state of mind to melt with sympathy for a wounded deer or dog and yet send our sons to the shambles of a modern battlefield?

The ethics of sport are still somewhat undefined. A great hunter once told me that he would feel ashamed to shoot rabbits and partridges because the animal had no chance. He shot big game only because, as he said, "if I miss the animal gets his chance". He never took more than one native with him, to carry an extra gun, and often enough he went entirely alone into the bush of Somaliland. It is noteworthy that most great hunters give up sport as they grow older; it is an evidence of a civilized soul, one that has become civil through experience.

Man is a hunter born. In ancient times he killed for food and thought little about sport or its ethics. His preoccupation was to bring home the dinner or go hungry, and, as in Africa today, animals were "nyama"—meat and nothing more. Sport is the result of applying mental restrictions to the science of killing animals. It creates right and wrong and should bestow some sense of dignity upon what otherwise is only the indulgence of a primitive lust. Sport is the morality of slaughter, a quality which men almost succeeded in introducing to warfare until the desire for efficiency made results the sole criterion of right.

It may be that Time will slowly eliminate sport as it is understood today, but however much we may wish for the conservation of wildlife, hating cruelty as men once hated heresy, we must face the fact that sport is held to be right and legitimate in our time. Our ambition must therefore be to increase the civilized sentiment that there must be some quarter given to the quarry; that because

some of us have invented instruments of wholesale death, it is no reason why they should be used for sport or even profit. True sport keeps alive and regulates, at the same time, the hunting spirit without which the average man seems unable to exist. There is something wrong about the person whose tender-heartedness becomes maudlin: perhaps it is in exact ratio to the meaner man who is utterly indifferent to animal suffering.

The rules of sport must be dictated by good sense. At least we should not kill more than we can use and it should be remembered that when the Government regulates the "bag" of a day, it concedes the maximum to the greediest of its citizens.

The game of golf was defined by somebody as "the art of putting a very small ball into a very small hole with instruments totally unfit for the purpose." But therein consists the sport, which is a contest with difficulty. Bushes, clothing and the back of his neck are what are easiest for a beginner to catch with a fly rod, but a real angler would rather lure a trout with a bunch of feathers on a hook than snare him with an angle-worm, which is far better bait. Skill with a gun comes from being called upon suddenly to use it by the unexpected appearance of game. To kill half-tame, hand-fed birds, accustomed to food in a farmer's yard, or when they are terrified and driven before the guns, is little more sport than to kill canaries with a hammer. What is difficult is to be desired; the skill emphasized, and even something risked, to make killing respectable by a civilized mind. Let us admit the savage in ourselves by cultivating his skill, for the man who can shoot a bird or a fish with a bow and arrow is still doing something which it is difficult altogether to despise. It is too much to hope that sport will ever deign to be useful. If the sportsmen must kill without control, it would be well if he would kill the enemies of the human race against which we have never been entirely successful. The rat and the wolf will tax his ingenuity to the limit and there are other dangerous things to which he might profitably direct his slaughterous intent, starlings in some places, English sparrows in others—but there is no hope of that. The sportsman prefers something easier.

SENATE WILDLIFE REPORT

Since the organization of the Senate Committee on Conservation of Wildlife Resources, we have had occasion to review, and quote in part, several reports issued under its auspices. All of these, and especially its first report (1931) and its voluminous statement of the hearing held in April, 1932, on the Migratory Waterfowl shortage, have been storehouses of useful knowledge. The latest "Progress of Wildlife Restoration and Management" recently issued, was, therefore, opened with a hopeful eagerness that turned to disappointed consternation as we read.

The first two pages of the report, where we find statements about *The Coordination Act, The Duck Stamp Act,* and *The Robinson National Forest Act,* may be classed as useful information. Next comes a foreword to the Senate and House Wildlife Report of the Bureau of Biological Survey, written by the Chief, Jay N. Darling. Couched in the slightly picturesque language of that ready writer it is distinctly readable. So far we read without undue perturbation. But the twenty-five pages that follow leave us with a mental complex tinged with shame, vexation, wonder, derision, pity and several other sensations. There are, it is true, about seven pages that contain fair examples of well-digested statements presented in moderate language. The rest, however, are unexpurgated addresses that presumably were delivered by the heads of various projects on the occasion of a conference held on August 6, 1935, when Senate and House Committees were the guests of the Chief of the Survey. What mistaken sense of courtesy, official exigency or unforeseen accident resulted in these speeches being consigned to type and distributed for the use of the committees and the public without the editing that such extemporaneous effusions are usually properly subjected to, is not revealed.

About half of the thirty-two pages of the report, however, are so crammed with errors of fact or of English, exaggerations, inept and ridiculous comparisons, inexact figures, and unessential details as to leave us wondering how so important a committee could be willing to sponsor the report; what could induce the Biological Survey to submit to the indignity that goes with such an ill-advised mass of unrelated and imperfect data; and what useful information the committees could expect to gain by its perusal.

HAWK LEAFLET

Leaflet No. 9 by Roger T. Peterson, on the red-shouldered hawk, was recently issued by the National Association of Audubon Societies. The plate, by R. Bruce Horsfall, is the same that accompanied Educational Leaflet No. 9, written by William Dutcher in 1913.

The text of the present brochure is an able and sympathetic presentation of the case for the bird, and brings out in an effective way its general usefulness, evidenced by stomach examinations and careful observations.

The esthetic charm of the "singing hawk" whose courting evolutions high in the air above the pine groves of New England, where so many of them used to nest, form the central theme of happy memories of many a spring excursion in our boyhood days, is well presented. The story brings to mind the clear days of April and early May, with the south wind singing in the pines, the deciduous woods still leafless, but bright with the scarlet flowers of the red maple, with the pine warbler trilling his gladness at being back in his nesting groves, and the throngs of northbound warblers feeding as they travel.

The brochure may be obtained from the Association at 1775 Broadway, New York, at five cents a copy. E. A. P.

CONSERVATION AND THE BOY

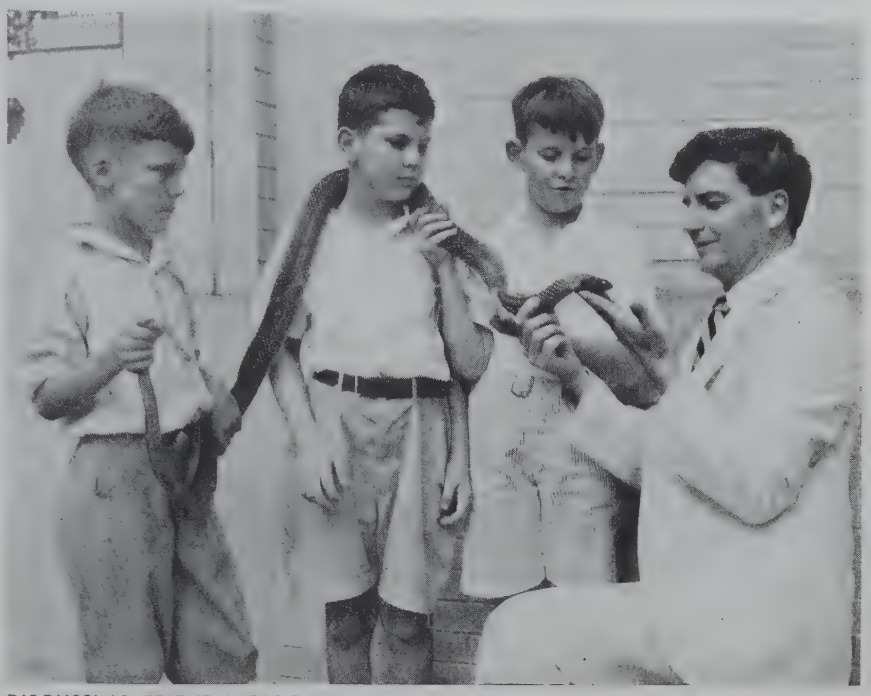
Building a sane, intelligent, sympathetic view of wildlife

By CHARLES H. GABLE

THIRTY-FIVE children come pouring into the room.

"Mr. Gable, may I have one of the lizards?" "Please, Mr. Gable, let me have Blue-Boy?" "Then I'm going to have the coachwhip!" "Mr. Gable, may we let the turtles race today?" "Dubbs on the baby 'possum!" "Mr. Gable, see my devil-horse here. Dad told me to kill it because it would spit in my eye and blind me; but I laughed at him."

A buzzer sounds in the hall, and there is a scurrying to chairs. What becomes of all the animals and things? Why, the children still keep them, of course. Why not? Old Blue-Boy, a seven-foot indigo snake, is stretched over the knees of four boys who gently pet him as he lazily crawls down the line across their laps. Mary has the coachwhip wrapped around her neck under her curls—her neck is nice and warm, and he likes it. The baby 'possum is perched on Billy's head clinging with all four feet and a mouthful of hair.



DISCUSSING FRIEND INDIGO SNAKE

Mr. Gable telling the boys how this snake kills rats and that in many places it is protected by the law

What in the world is this? you wonder. A class in school? A show? Or a nightmare?

Whatever it is, there is nothing like it in the State of Texas, and probably not in the United States. True, it is held in a classroom of a public school, and it is listed in the curriculum as "Science"—but that is like naming the baby "Jack", and then having it turn out a girl. "Science" is organized knowledge, and what ten-year-old boy or girl is interested in *organizing* any knowledge?

Some have tried to call it "Nature Study", but if anyone ever "studied" in the class, I failed to catch him at it. It might be called a "Nature Class", but who ever heard of a "class" without "lessons", without homework, without notebooks, without examinations? So there it is—you name it, I can't.

The scene described above has been repeated, with infinite variations, more than seven hundred times in the last four years, in the Elementary School of Alamo Heights, a suburb of San Antonio, Texas. Eight classes, with a total of about three hundred children, between the ages of eight and twelve years, pass through this room each day of the school year. More than five thousand, six hundred discussions of Nature subjects have been conducted, dealing with almost every conceivable subject and some of them not conceivable. It is an open forum; the lid is off; any child may ask any question about Nature at any time: What are ticks? Is it true that deer have ears in their feet? What makes it thunder? How do snakes have their babies? How long do spiders live? Where does mercury come from? How do skunks make their smell? Should we kill owls? Is there any difference between a wild turkey and a tame one? How far is it to the stars? Do baby scorpions eat their mother? How can you tell a mamma lizard from a papa lizard? What are "rooster eggs"? And so *ad infinitum.*

But not all of our time is spent in talking. Someone asks for pictures. In less than two minutes, the windows are darkened and a picture show in progress. We may use lantern slides, or, more likely, the reflecting lantern known as a "Balopticon". In this lantern, we can show photographs, pictures from magazines or books without injuring them, or specimens, if they are not alive. Pictures are shown in whatever colors they are printed and specimens in their natural colors.

Usually we have movies once a week. Films are obtained from our own State University and generous, good-natured friends in various scientific institutions throughout the country.

There really is a "method in our madness" in spite of the fact that the informalities give our dear methodical co-teachers a bad case of "jitters"; and it is quite certain that privately they hold there is more "madness" than

"method" in our processes. But they are learning the truth.

When we started four years ago, we envisaged this objective: "Build into the lives of our young people a sane, intelligent, sympathetic adjustment toward the living world about them".

We did not know at first how to materialize this objective, but we devoted our entire time and all our knowledge of the psychology of animals, both human and otherwise, to the undertaking.

We made a little headway and many mistakes in our first efforts. Real progress, however, dated from the moment we fully comprehended the thing we were trying to establish was an emotional attitude and not an intellectual development. The keystone of that emotional attitude, we discovered, was "Friendship".

Whenever you create in a boy an attitude which prompts a smile of friendly greeting as he meets a little lizard; or looks up with a grin of welcome to the old gander leading his flock to the Southland, and mutters to himself: "Hello, Old Top! You have given the hunters the slip this far. I'm betting you'll make it the rest of the way. Good Luck!" you have created a conservationist.

Will that boy stand placidly by and watch some fellow smash his lizard friend? Not once in a thousand years. If you know boys, you know they will fight as long as they can stand for consideration and protection of their friends.

We eliminated from our program every element which might hinder the development of this friendly attitude: Hated written examinations, drudgery of notebook keeping, dictatorial discipline, fear of wild things, preaching.

We inserted everything we could which was conducive to the development of this attitude: interesting facts about Nature subjects, actual contact with as many as possible, amusing habits, stories and personal experiences, self-expression, informality, sympathetic attitude of teacher, stimulating discussions in which children are guided into sane attitudes toward wildlife, encouraging country trips and reports on things seen, in fact, anything, everything that would contribute pleasure to the program.

It is a great satisfaction to us that this program is really effective. Dozens of parents come to us thanking us for the happy change in the attitude of their boy toward wildlife. They laughingly tell us they have Nature discussions in the home for breakfast, lunch and dinner.

This continuous enthusiasm of the boys has in a wonderful way stimulated the interest of the parents. Parents respond to their children as they respond to no outsider. A discussion of conservation read in a magazine is interesting, but impersonal. The child's plea to protect the lives of his little friends becomes a vital, personal matter about which Dad is going to do something.

We owe a debt of profound gratitude for the tireless, generous, unselfish efforts of our many champions of conservation. Were it not for their efforts, we would have little wildlife now left for which to fight. But their fight has not been a complete victory—it has been a postponement of defeat, and that defeat seems almost certain unless some additional, practical, definite, constructive program is carried out.

You can not make people moral by law; you can not make people friendly by law; you can not make conservationists by law—you can only make people stop doing certain things by law.

Conservation, to date, has been concerned almost exclusively with the legal protection of wildlife—the mechanics of conservation. What has been done to cultivate love for wildlife—the *soul* of conservation? Can victory be expected from a purely mechanical process without the emotional support of a soul?

In these four years of laboratory work in the school of Alamo Heights, we have learned not only how to put over a program in our own school, but we have done much of the preliminary investigations essential to building a program which could be generally adopted in elementary schools without radical changes or disruption of present teaching methods.

We have also ascertained what kind of a program would be acceptable to teachers and supervisors. We have consulted college authorities on the development of training courses in Nature for elementary teachers.

Here, then, is a definite, concrete, practical plan for accomplishing exactly what is the hope and prayer of every Nature lover in the United States—universal conservation consciousness.

We happen to know that the educational world is now watching for a leader in Nature education. Such a leader has not yet appeared. Those interested in conservation must decide whether they will leave this development to chance with the certainty that "Science" will be the major concern, or will actively participate in the movement and build into it the dual conservation idea—PROTECTION AND LOVE FOR OUR WILDLIFE.

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The Third Annual Report of the Hawk and Owl Society, being Bulletin No. 5 of that organization, was issued in June, 1935. Among its more important features are statements of the purpose and the organization; the Annual Report of the retiring Secretary, Mr. Warren F. Eaton, (who resigned to carry on the Hawk and Owl Campaign of the National Association of Audubon Societies); the Supplementary Report of the present Secretary, Charles K. Nichols; "Hawks and Owls in the Southeast", by Alexander Sprunt, Jr.; Quotations from Correspondents; "An Indiana Hawk Migration", by Lawrence E. Hicks; "Additional Material on Food Habits"; "State Laws Relating to Birds of Prey", by Warren F. Eaton; and a list of articles on Hawks and Owls in addition to those that have appeared in various bibliographies. This fine report, which contains a considerable amount of original information, may be obtained for five cents from the National Association of Audubon Societies, 1775 Broadway, New York City.

E. A. P.

BUSY AND INTERESTING TIMES IN A PRINCETON SCHOOLROOM

Members of one of the classes at work on the projects that taught a valuable lesson in Christmas green conservation and had many helpful by-products

A Christmas Green Conservation Project

By DOROTHY M. COMPTON

Teacher of Nature Study, Princeton, N. J., Public Schools

"How fragrant you smell in here!" said the elementary school principal, as she poked her nose in at the door of the Nature Room. It was the sixth grade's Nature period, two weeks before Christmas, and the class was just commencing work upon a project carried out in the Princeton schools for the last five years —the making of Christmas wreaths. The children were scattered about the room in little groups, seated on the benches or on the floor, each engaged in wiring small bunches of greens to a wire circle foundation.

It all came about through the Princeton Garden Club. We had always taught conservation of Christmas greens in Princeton. We had made posters for the halls of the school and for store windows; we had tried various projects. Then, five years ago, the Garden Club came to the schools to ask if it might help by holding a wreath contest among the children of the upper elementary grades, the wreaths to be made from cultivated greens and substitute berries. Garden Clubs all over New Jersey that year were participating in adult wreath contests sponsored by the New Jersey State Museum. The Princeton Garden Club conceived this idea of similar conservation education for children.

That first year we made just a small beginning—the children supplying all of the materials and doing a great deal of the work at home. But so few of our children have access to greens that the second year the Garden Club sent in from the homes and estates of such of its members as could spare them clippings for the use of children who had none, and most of the work was done at school. This enabled many more children to make wreaths and proved very satisfactory. The last three years all of our greens were sent in from the Garden Club. We had three classes in each of two schools (5th and 6th grades) working upon wreaths and a total of about 130 wreaths.

Wreath-making is not an easy project for small children. It takes much patience to use short pieces of greens; to keep the overlapping bunches close enough to cover all cut ends; to keep hemlock flat and right side up, and to wire tightly enough to prevent slipping. But we feel we have had worthwhile results, enough to warrant repeating.

As a foundation for our wreaths we use old cable wire supplied gratis by the Public Service. They cut it for us in lengths of about 39 inches, and the boys untwist the strands and bend them into hooks at each end to form a circle.

For greens we like arbor-vitae best, but are able to secure only a little. Hemlock and yew make lovely flat wreaths. Common red cedar, or any of its cultivated relatives, makes a fine dense wreath. The last two years all of our wreaths were made of red cedar. We have had some good results with spruce and fir, but their needles drop so quickly we prefer others. Pine, unless it is a short-needled variety, is hard to conform to a wreath shape, but is lovely in combination with other greens. We have even had two wreaths of ivy, but I personally find them too suggestive of the funeral parlor, and much prefer the conifers.

Either cord or fine wire may be used to fasten the greens to the wire foundation, but wire is easier to work with. Each child supplied his own wire. Wires from milk bottle caps went into one very successful wreath. Rolls of picture wire, unstranded, made a cheap wrapping material for a great many others.

THE WINNING CHRISTMAS WREATHS
All of the materials used came from sources that expressed the need of conservation

For decorations there are many possibilities. Artificial red berries may be used, or, if one prefers natural material, barberry makes an excellent substitute for the rare hollies. We have used rose hips; chokeberry, shellacked and touched up with red enamel; and one boy effectively used privet berries, painted red. Green-brier berries may be used. Cranberries were very popular at our colored school. All berries should be shellacked to prevent drying and to add a glossy finish.

Besides berries, many artistic trimmings may be made by painting pine cones or dead tops of common weeds, such as thistle, goldenrod, aster, yarrow, moth mullein, evening primrose, butter and eggs, and grasses. Dry fruiting fronds of sensitive fern were used and oak bullet galls. Among the fruits, a great favorite was sweet-gum balls. Acorns, catkins and cones, and even the round buttonwood balls were effectively used. We used three colors —red enamel, silver and gold radiator paint. Many were the various arrangements secured, stress being laid upon originality in design. A few children used red ribbons on their wreaths. A large part of the weed materials was gathered one year by the Nature Club, a small group of fifth and sixth grade pupils, who devoted one Friday afternoon club period to gathering suitable materials. And what a grand conservation lesson we had when we found one lovely large bush of winterberry or deciduous holly, just loaded with berries, and several sprigs of nice bittersweet, and left them all untouched to keep on growing! Last year each class participating in the wreath work took a "hike" and each pupil selected his own decorations from the fields.

Through our wreath project we learned the present rarity and danger of extinction of our wild greens—holly, ground pine, and laurel. We found, too, that nurserymen are learning how to grow and safely to cut holly and laurel, so that in time we may hope to use them again, as cultivated greens at least, but that for the present the only safe plan is to use substitute cultivated greens and to refrain entirely from buying the wreaths made of the wild rare materials. The generosity of the Garden Club members in supplying cultivated greens from their abundance made a great impression upon the children as to the value of saving the wild ones.

A wreath-making project takes a great deal of time. It takes from two to four hour periods to form a good green foundation, paint the ornaments, and fasten them in among the green background. But, this being one of the fortunate schools where a flexible program exists, the time element was easily provided for.

We had, of course, the problem of storing greens and wreaths to keep them from drying. This was met by piling them in the Nature "stock room", a fairly large cloak room without heat. By keeping doors closed leading to it we obtained a temperature low enough, and daily sprinkling with water kept them perfectly fresh. The wreaths were hung, the day before the judging, in the Assembly Room where all classes might see them. After the judging, each child took home his own wreath.

The judging was done by a committee from the Garden Club. We had quite a little discussion about prizes. Princeton schools do not favor prizes, believing that the child should work from the joy of the activity itself and not for the reward of a prize. It was finally decided that prizes should be books for our school Nature Library, each to be inscribed with the name of the prize winner. At a special assembly the Garden Club committee awarded the book to the winner who took it home with him for the holidays. At an early January assembly, he presented it in turn with a short speech of his own to the school library. (I use "he" advisedly—strange how many firsts are carried off by boys each year!) (Continued on page 375)

ACCIDENTS AND ★ ★ ★ BILLBOARDS

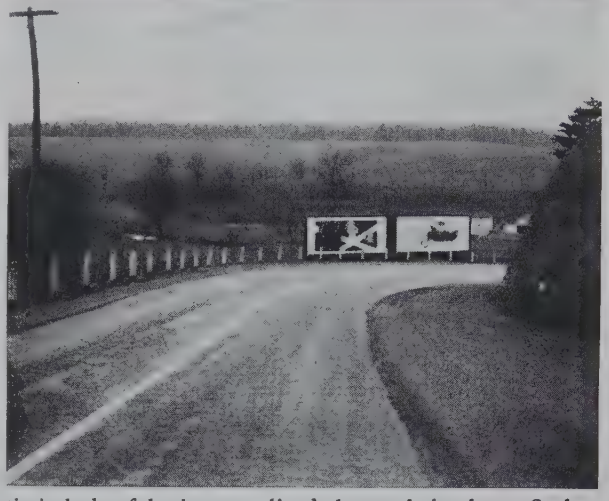
Making our highways a safer place on which to travel is a vital problem. The daily toll of dead and injured harks back to war casualty lists. Many expedients have been tried to solve the problem, and some of these have been hysterical, illogical and even dangerous in themselves.

A striking example of this kind of attempt to check accidents is to be found in the accompanying photographs. The upper picture shows a frightening signboard picture calculated to scare the automobile driver into careful driving. The lower picture shows this sign on a billboard site on a dangerous curve in Pennsylvania.

Students of highway accidents agree that many crashes are due to inattention. Nothing can cause inattention more effectively than the attention-compelling billboard. It is erected for the very purpose of commanding the motorist's eyes to look at it. If it doesn't accomplish this, then the advertiser on it is throwing away his money.

Highway authorities likewise agree that billboards are a distinct menace at curves and intersections. The trend of recent legislation reflects this view. Yet it is at such points that the billboard industry likes best to erect its dangerous and disfiguring signs. More than that; in these pictures we see the State Highway authorities contributing to the hazard of rounding this curve by joining with a cigarette advertiser in trying to attract the motorist's attention from the business of driving.

This practice of contributing signboard space to a supposed safety campaign has been seized upon by the organized billboard industry as a means of heading off inevitable restrictive legislation. It gives them a friend in court in State Houses. Highway departments in several states have fallen for such offers. Some have finally seen



their lack of logic or realized the catch in them. Such a billboard as that pictured, in such a place as that pictured, will kill more than it will scare or educate. And the place for the distracting billboard of any sort is not along the rural highway.

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One of the largest users of rural billboard advertising in California has been the Albers Brothers Milling Company of San Francisco. Recently they were requested by a local garden club to remove a particularly offensive sign. The company responded by advising the California Garden Clubs that they will remove all their rural billboards from the landscape of the Golden State. More and more national advertisers are realizing that rural billboard advertising is offensive to a growing body of the public.

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Medicine Lake Migratory Waterfowl Refuge, 23,700 acres of submarginal land in northeastern Montana, has been set aside by Executive order as a part of the Biological Survey waterfowl program. It will serve as a breeding and resting area, will be closed to agriculture and fenced. The announcement of its establishment does not state whether the area will be an inviolate sanctuary, with all shooting banned, or whether some shooting will be permitted.

Under a law placed this year on the statute books of Wisconsin a course of study designated as Conservation of Natural Resources will become a part of the curriculum of the State University, the State Teachers Colleges and the County Normal Schools. Under the law, after three years this course will be introduced into the common and high schools of the state as a part of the general curriculum.

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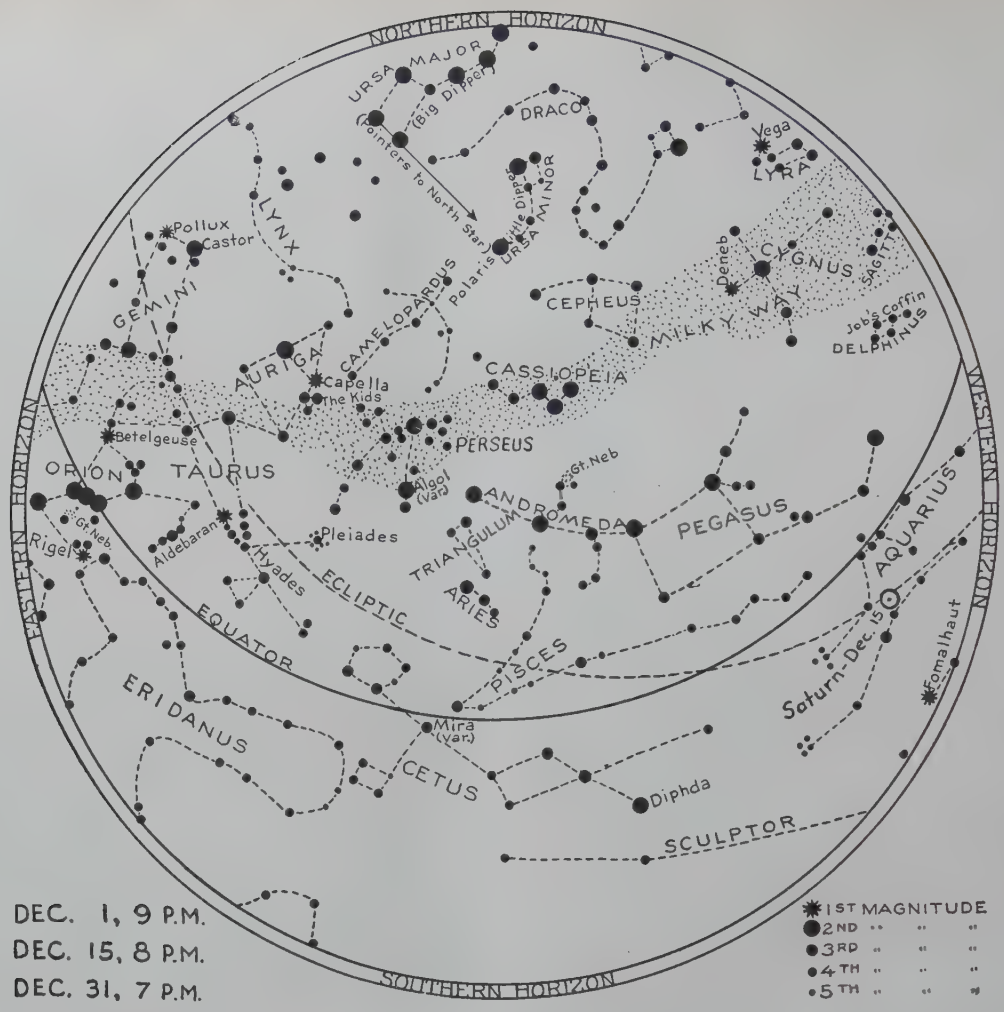
At the last session of Congress the creation of the National Park Trust Fund was authorized for the furtherance of National Park projects, particularly in connection with the preservation and restoration of historic sites and areas of scientific geologic interest. The first contribution to this fund was a check for $5000 from Metro-Goldwyn-Mayer, producers of the motion picture "Sequoia". The contribution was made in appreciation of the cooperation of the National Park Service in making this splendid wildlife conservation film possible.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

The Royal Group in Northern Skies

By ISABEL M. LEWIS

HIGH in the heavens above the pole on these clear, cold winter evenings may be seen the four constellations of the so-called Royal Group—Cepheus and Cassiopeia, Andromeda and Perseus—which represent the chief actors in one of the most widely known of all the legends of the stars that originated with the Greeks centuries before Christ.

Cepheus, it seems, was the King of Ethiopia, and Cassiopeia was his beautiful but vain queen who unwisely boasted that her beauty was greater than that of the sea nymphs. Incensed by her insult the nymphs persuaded Neptune, ruler of the seas, to punish her. This he did by decreeing that her daughter, Andromeda, should be chained to the rocks by the sea to become the prey of the sea-monster, Cetus. The huge constellation of Cetus, one of the largest in the heavens, may be seen also at this time extending across the southern sky below Pisces and Aries to Eridanus, The Sky River.

Now it happened about this time that Perseus, The Champion, was returning on his winged steed, Pegasus, represented by the constellation adjoining Andromeda on the west, from the conquest of Medusa, the baleful creature who turned to stone all who gazed upon her. Perseus was bringing with him her decapitated head. Far beneath him he saw the form of the fair maiden chained on the rocky seashore and in the distance the ugly head of the approaching monster. Perseus spurred on his horse, which raised in his haste the dust typified by the star clouds of the Milky Way. The hero turned the sea monster to stone by holding before his eyes the horrible head of Medusa and rescued the maiden. Later all four members of the group were transported to the heavens. The queen, Cassiopeia, as a lesson in humility, was tied to a chair which encircles the pole and is so placed that the queen, part of the time, sits with her head turned downward and her feet directed toward the pole.

Cepheus sits beside his queen. The ancient star atlases represent him dressed in his royal robes and seated on his throne, holding his robes in his right hand and a scepter in his left hand. His head is marked by a group of stars including Delta Cephei, a beautiful double, visible as such in a field glass, and also a noted variable star. In fact this star gives its name to a large class of variables of peculiar and important light changes that are suspected to be due to the pulsations of the stars or periodic expansions and contractions of their masses. Delta Cephei goes through its cycle of light change in five and a fraction days. As the star's brightness varies two and a half magnitudes in this period, the change is easily observable with the naked eye. Delta lies near Zeta Cephei, the bright star in the constellation farthest from the pole. (See star chart.) These two stars, with two fainter ones, mark the head of the King. One of the Coal Sacks of the Milky Way, a name for dark areas singularly devoid of stars, and which are possibly dark nebulas, lies close to the head of Cepheus. A field glass will reveal much that is interesting in this constellation as well as in the other constellations of the Royal Group all of which, with the exception of Andromeda, lie directly in the path of the Milky Way.

The region of the Milky Way in Perseus is one of the finest in the heavens, rich in double stars and clusters. The magnificent double star cluster in the Sword Handle of Perseus lies just a few degrees below Cassiopeia in a prolongation of the long line of stars in Perseus that includes Alpha Persei, the brightest star in Perseus. These clusters are visible even in a field glass and are among the finest clusters in the heavens for small telescopes. Alpha Persei is a star of second magnitude. It lies at the center of a curved line of stars open toward the northeast and known as the Segment of Perseus. This is part of a line of stars that continues southward almost to the Pleiades in Taurus. The north end of this line of stars terminates in the star of fourth magnitude, Eta Persei, just above which lies the Sword Handle with its twin clusters.

By far the most interesting object in Perseus, and one of the most noted in the heavens, is Algol, The Demon Star, which lies in the head of Medusa, which Perseus is represented as holding in his left hand.

Algol lies at the right angle in the right-angled triangle formed by Alpha Persei, Algol and Gamma Andromedae the farthest east of the three second magnitude stars in Andromeda, next to Perseus on the west. With the greatest regularity, in a period of two days, twenty hours, and forty-eight minutes, the brightness of Algol decreases. Usually the star is a little fainter than second magnitude, but, within four and a half hours, it drops to three and a half magnitude. It remains at this minimum brightness for about twenty minutes and then gradually regains its original brightness. The variations in the light of this star were noted as early as the year 1672, and the period of its light changes was determined in 1782. It was suspected then, and is known now, that the variation in the light of this star is caused by a dark or faintly luminous star revolving about it and partially eclipsing it in every revolution. From the observations the following facts have been learned. The bright star is 1,250,000 miles in diameter, the fainter star 1,450,000 miles. The centers of the two stars are only 3,000,000 miles apart and they revolve about one another in 68 hours and 49 minutes and the plane of their orbit is slightly inclined to us so the eclipse that we observe is partial. The stars are at a distance of about sixty light years from the earth. About nine o'clock in the evening at Christmas Algol will be found almost in the zenith, or directly overhead, in the latitude of New York City.

Cassiopeia is one of the circumpolar constellations that never sets in these latitudes. It is seen at its best in winter evenings when it lies high above the pole. It is always easily distinguished by its characteristic W. This constellation is often referred to, popularly, as The Lady in the Chair. The star Beta Cassiopeiae, or Caph, is the star in the W that leads the others in the daily westward motion, or is farthest west. It lies also in the upper, left-hand corner of the chair. A line connecting Polaris with Beta Cassiopeiae and the star Alpha Andromedae, or Alpheratz, in the northeast corner of The Great Square in Pegasus, points to the vernal equinox and is the hour hand of a great sidereal clock. At sidereal noon it is above Polaris on the meridian. When it is due west the sidereal time is six hours, when due south of Polaris it is twelve hours, and when due east eighteen hours. With practice one can estimate the sidereal time within fifteen minutes by means of this celestial clock. This sidereal time must be changed into sun time, however, and to do this it must be remembered that about March 22 the two clocks are together and the sidereal clock gains on the solar clock four minutes a day, or two hours in a month. One can easily estimate, then, for any time of year, the number of hours to be subtracted from the time given by this sidereal clock to find the solar time.

Among the planets this month Saturn and Mars may be seen in the west after sunset. Saturn is in Capricornus and is in conjunction with the moon on December 2 and December 30. Mars passes from Sagittarius into Capricornus and is in conjunction with the moon on December 28. It will then be about fifteen degrees southwest of Saturn. Mercury is in superior conjunction with the sun on December 10, and will not be visible until toward the end of the month. It will be in conjunction with the new moon in the southwest on December 26. Jupiter is now in the morning sky but too close to the sun to be seen until late in the month. It will be in conjunction with the waning crescent moon on December 23. Venus is now a magnificent object in the morning sky before sunrise.

On Christmas Day there will be an annular eclipse of the sun visible in Antarctica. The central line of eclipse will pass close to the South Pole. The partial eclipse will be visible in the southern extremity of South America, the South Pacific and South Atlantic. The sun will reach its greatest southern declination on December 22 at 1:37 P. M. when winter will begin.

Trailside Treasures

THE CHRISTMAS GIFT

By JANE ADAMS PARKER

"MY," said Aunt Dot, "what wonderful appetites you children bring down to the cabin with you."

"Everything tastes so good, after our long, cold walk through the woods," said Rosy, over her shoulder, as she helped Jo stow the last of the dishes away on the cupboard shelves.

Jerry dropped another log on the fire, and sat down on the wood-box in the chimney corner. "Grandpa said he'd blow the whistle if our Christmas package came," he said. "So we won't have to hurry home."

"Then let's begin with Rosy and tell one another some of the things we've found out about ants," said Aunt Dot. "You know that's what we had planned for today."

Rosy and Jo pulled their chairs nearer Aunt Dot's and Rosy began slowly, "I did find out a lot of queer things, but I've forgotten some of them. I do remember that little ant nurses seem to brush and comb the baby ants with their man-di-bles—you know, their jaws—and wash their faces something like a tabby cat washes her kittens. Now, Jo, you go on. . . ."

"Why, Rosy," said Jo, "don't you remember that day Grandpa put the piece of glass down into the ant nest and scraped the earth away from one side? We could see all the different galleries. Don't you know how the little ant workers ran to take the eggs and cocoons in their jaws and carry them down into the lower galleries? That's where they take them in very rainy weather, or if it gets real cold. Then, when the weather is warmer again, they carry them up into the sunshine.

"Mother said ants lie down to rest sometimes and the young ants play around the opening of the nest very much like little children play around their homes. Sometimes ants have guests in the ant hill, and feed them all winter along with their own ant families. The new queens have wings at first. But they bite them off when they fly out to start homes of their own. They live all alone and do all the work until the little daughters hatch out of the eggs these queens have laid. . . ."

"But first they are just little grubs something like the baby bees," Rosy interrupted.

"Yes," went on Jo, "and these little grubs sleep in cocoon cradles until it's time to come out an ant. And when they grow up they do all the work and feed and take care of the mother queen."

"Some ant colonies have soldier ants that go out and fight and bring home eggs and cocoons from other ant hills. Then these little ants grow up as their slaves," said Jerry.

"Speaking of mandibles," said Aunt Dot. "Do you know the ants use them in many ways? They carry the food back to the nest in them. They use them like scissors to cut up leaves and large pieces of food. When they are tunneling out passages, they use them like little trowels to scrape away the soft dirt and pack it into place to make strong walls. Then they carry the earth pellets up and pile them outside of the hill."

"They carry up the scraps left from their food, too, the parts they can't eat," went on Jo, "and pile them outside, in warm weather. But in winter they use a separate gallery for all the rubbish until it's time for spring house cleaning."

"Ants use their feelers—their antennae," Jerry corrected himself, "to stroke the aphids to get the honey dew. They smell with them and guide themselves about with them. . . ."

They were all so interested in talking about the queer doings of ants that the first thing they knew Grandpa Arnold was standing in the open door smiling at the row of sober faces.

"Well, well," he said as Jerry stopped to look up, "I blew and blew the whistle and no one came. So I thought I'd better come down and see what had happened. And here you are all warm and cozy telling ant stories around the fire. Here's your Christmas package. It just came a short while ago."

They all gathered around the table as Grandpa opened the box—

(*To be continued.*)

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Bird Apartment Houses

By CLARENCE M. WEED

In 1492 Columbus landed at a small island next to Cuba which he called Hispaniola or New Spain. Later it was called Haiti. Here he returned in 1493 and stayed several years. He made the first colony in the New World—the city of Santo Domingo. The island is of interest because of the plants and animals living on it. At sea level these are tropical forms. In the high mountains of the interior the types of life are like those found farther North in the United States.

The birds of Haiti have been studied by eminent scientists. But the original student of Haitian birds was Columbus himself who "was charged by Queen Isabella to collect birds." In the great Barcelona parade of April 1493 bird skins and live parrots were displayed. Very likely some of these were from Haiti. Columbus tells in his journal of a bird on this island that sang like the nightingale—probably a mocking bird. I wonder if he saw a barn owl in those early days.

As shown in the first picture Royal Palms are abundant in the tropical regions of Haiti. They are very tall with no branches lower than the feathery top. One wonders if Columbus noticed the strange bird homes that the palm-chats build in these stately trees. These rather small birds, about the size of our cedar waxwings, live happily together in small flocks of two or three families each. When resting by day or roosting by night they retreat to the stick nests that they build in the basal stems of the palm leaves. They are thus saved from attack by barn owls and other enemies.

The strange palm-chat nests are as large as bushel baskets. They are made of sticks and pieces of branches interlaced by the chats working together. Through the center runs an opening large enough for the birds to pass in and out. Various other openings serve as retreats and nesting places for the birds. The eggs are held within by dried grasses and bits of shredded bark.

Nature Magazine in School

At the Ice King's Board

This is a delightful article full of suggestions for those who at this time of the year feed the birds. It would be splendid to use in connection with the series of lessons dealing with the economic value of birds, or with the subject of bird migration, the winter homes of birds, and in other ways.

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Tracking Animals in the Snow

This article suggests an activity that pupils enjoy, and one that can be encouraged. So great is the interest in this subject that it lends itself to indoor as well as outdoor use, in getting pupils to study the lives of the creatures represented. Teachers could have exhibitions showing the best drawings, kodak pictures or clay models of animals' tracks. These displays, as well as drawings of tracks on the blackboard, might be used as one means of initiating a unit dealing with some phase of animal life.

●

Nature "Rolls Her Own"

Those who live in parts of the country where these natural snowballs are found have a real opportunity to contribute to scientific knowledge by accurately observing and reporting what they see. The occurrence of this phenomenon would undoubtedly arouse great interest regarding the causes; such as the adhesion of particles of snow, the pushing force of the wind and the initial obstruction that caught the wind. This could be used to motivate further study of the causes of snow, rain and other weather conditions. Some classes would want to find out something about adhesion, friction and motion, all of which are illustrated by these snow rollers.

●

What Kind of a Christmas Tree Is Yours?

The evergreen trees used as Christmas trees are good examples of the type growing at higher altitudes. By comparing a branch of one of these with a broadleaved tree pupils can discover for themselves that the twigs of these trees are flexible, the needles thin and the shape conical, all tending to make it possible for these trees to grow in locations where they are subjected to such heavy snows and high winds that no other type of tree might exist. Not only are these conifers fitted to withstand the wind but they also use it to transport their seeds. By removing seeds from the cones the pupils can readily see that the seeds are fastened in a paddle shaped wing which, when dropped from a height, settles to the ground with a spiral motion, that retards its fall, and allows the wind to move the seed a certain distance from the parent tree.

The needles show variety in their adaptations for shedding snow, some being stiff and short, others long and flexible; some sharp-pointed; others rounded. Such questions as suggest themselves: Which could grow more readily at timber line, an oak

In order that teachers and parents may further use Nature Magazine as an aid to the study of Nature and Science, this page is devoted to the following brief notes based upon articles in this issue and suggesting ways in which they may be used as a source of inspiration and information. To bring these Nature study thoughts to our readers we have obtained the services of one eminently qualified for the task, and this department is edited

BY ESTHER SCOTT

Instructor in charge of Elementary Science Washington, D. C., Schools

●

or one of the conifers? Why? At what season of the year are evergreens greenest? These tend to develop interest in the many adaptations of the conifers and lead to further investigation of the life processes of evergreens.

●

A Christmas Green Conservation Lesson

This is a splendid example of real teaching and of home and community cooperation. At this season of the year, when pupils want to make a wreath anyway, this activity affords an opportunity to teach conservation among other things. The method used by the writer to achieve the latter objective is worthy of note. To the extent that it was practical the pupils collected the materials for their wreaths. Those who participated had the opportunity to see for themselves the relative scarcity and abundance of certain evergreens. When one of the rarer species was found, the whole group was confronted with the temptation to take it. If the teacher, parent or some other leader was able to make the group understand why this particular species should be left growing, afterwards, as individuals, they might be able to make the same decision. Each time they did the choice would become easier until conservation became a habit.

Such wreath-making contests in school and at home sponsored by Garden Clubs and conducted along lines similar to those outlined in this article would be quite as desirable in other states as in New Jersey.

●

Buzzard Pictures

The buzzard pictures in the rotogravure section are especially useful in connection with the series of lessons suggested in the October issue on the economic value of birds. Buzzards, together with the sea gulls, have a special rôle in the interdependence of living things. Their work on land and the sea shore could be compared to that of the snail in the school aquarium and to certain invisible micro-organisms at work on all organic material in the earth. The feeding habits of all such scavengers make possible the removal of dead materials, thereby clearing the way for the living.

Carpenter Moth

In lessons dealing with forestry, the pictures of the various stages in the life of the carpenter moth would be most useful in bringing out one of the destructive phases of insect work. Life in the forest is like a community where trees, bushes, flowers, moss, invisible micro-organisms, birds, mammals, reptiles, fish, batrachians, insects and the inorganic soil are associated so that under normal conditions each maintains its proper place. There are, therefore, both constructive and destructive forces at work to control this balance.

●

Conservation and the Boy

Here is an article, every word of it true, that strikes at the root of the difficulty with conservation. In the race for knowledge it is easy to forget that appreciation of wild life is an emotional attitude and that the keystone is friendship.

How can teachers develop this point of view? Not so much by having pupils read about animals and plants as by giving them actual experience with them. It is through taking care of living things that the finer, higher qualities such as a sympathetic understanding of and tolerance for wild life is developed. Pets and gardens are worth all they cost in time and trouble.

In developing this emotional attitude, more use could be made of dramatization, either with puppets in a marionette show, or by having the pupils themselves take the parts of animals. Without either personification or animism it would be possible to write the life history of any wild creature showing his escape from or his capture by natural enemies.

●

ROTOGRAVURE SEPARATES

We have received a number of inquiries from teachers asking whether extra copies of our Rotogravure Section could be obtained separate from the magazine. Most of these teachers wanted the extras for mounting, posting, scrapbook, or other class projects.

Owing to certain mechanical considerations in connection with printing the magazine, we have in hand some extras of the Rotogravure Sections from October, 1934, to September, 1935, inclusive. These are untrimmed and admirable for the above-mentioned purposes. The task of collating these, and the cost of making them, have made us hesitate about announcing their availability. However, there appears to be a definite demand and use for them.

Therefore we are making available complete, unbound and untrimmed sets of the first twelve months (192 pages of Nature pictures) of the Rotogravure Section at one dollar a set, or the first or last six months (Oct., 1934, to Feb., 1935, or March, 1935, to Sept., 1935) at fifty cents a set. Extras of one particular month are available at ten cents each as long as they last and *provided at least ten extras from any one month are ordered at one time.* In the event that one or two months of 1934-1935 become exhausted it may be necessary to substitute separates of October and November of 1935 to complete the twelve issues.

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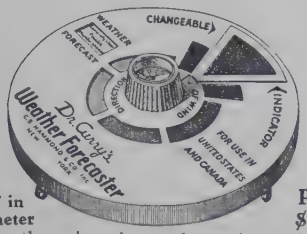

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THE ROC OF AGES

(Continued from page 344)

The animals to which these bones once belonged were mostly mammals of known types, but were small "island varieties" as they were called, all now extinct.

Among these animals was a tiny elephant, the so-called pygmy elephant, looking exactly like its large cousins, trunk and all, but only three feet high when full-grown. Together with the bones of the pygmy elephant were discovered those of a giant bird, named *Gyps melitensis*. This bird may have played a part in the Roc story. It presumably would have been able to carry one of the pygmy elephants, at least a young one.

Now, possibly, we have the following picture: the early inhabitants of the countries near the Mediterranean knew the Malta bird and the pygmy elephant. They also knew the large elephant, of course, and distinguished between them. But later, when the pygmy elephant probably was already extinct, the Arabs heard the story and got mixed up between the pygmy elephant and the large one. Apparently they did not know the *Gyps melitensis*, but knowing only the large elephant they had to invent a bird sufficiently gigantic to carry it, and so the story of the Roc came into life.

A CHRISTMAS GREEN CONSERVATION PROJECT

(Continued from page 368)

Two or three honorable mentions were also awarded.

Aside from the main conservation angle, we find a great many other values in a project of this type. The children learn easily the common evergreens and their characteristics, some of the weeds, and that cones may shed seeds into the paint can; we have two weeks of joyous Christmas activity among most fragrant odors and sticky hands; and a valuable tie-up with the life of our town and our public-spirited Garden Club members. And does not the presentation speech of one 6th grade boy show valuable training in good citizenship?—"This is the book I won for making my Christmas wreath. It is called *Autumn,* by Oliver Metzger. It tells about things to find out-of-doors in the fall. Here is a picture of a roadside in autumn. I am going to put it in the Nature Library in the Nature Room, and I hope you will all get a chance to read it, too."

Boy Scout Bulletins

Boy Scouts in Allegheny and Beaver Counties, Pennsylvania, are fortunate in having a leader in the person of William C. Grimm of Pittsburgh who each month prepares a Nature bulletin for circulation among the Scout leaders of the Allegheny Council. This is a mimeographed publication but it is distinguished by the finest example of mimeographed drawings we have ever seen. Mr. Grimm makes these bulletins seasonal in character and includes some excellent conservation material.

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Hiking and Camping Forum

Conducted by
ERNEST A. DENCH

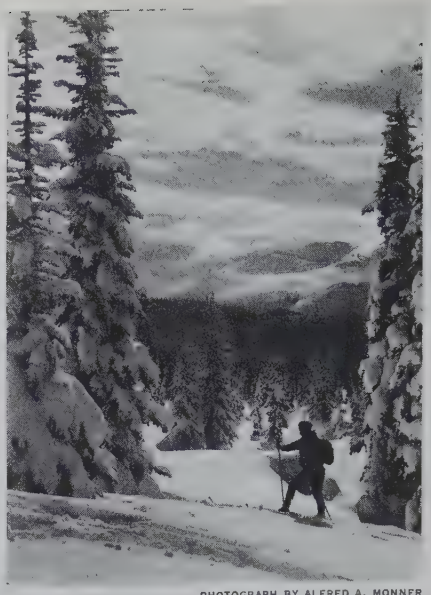
Hiking and camping inquiries will be answered by mail if a stamped, addressed envelope is enclosed. Address the Forum editor.

"Our 'Rain for the Asking' booklet explains how you can have RAIN when and where you want it," runs an irrigation ad in an agricultural paper.

Hikers and campers will, of course, decline the offer with thanks. When J.P. chooses to work, on goes the hiker's protective armour—waterproof clothing and equipment—practical suggestions for which are given in our "Let It Rain" bulletin. Members need remit only 3 cents; all others, 10 cents.

Brevities

A sad note—the departure of glorious October. But we had some fine trips, didn't we? Brooklyn (N. Y.) Institute of Arts and Sciences held four hikes—a gain of two from October, 1934. Forum editor conducted them all. Other groups on a fortnightly or monthly schedule might consider, next year, weekly trips in October. . . . *Flaming Foliage* hike of the Blue Mountain Club of Pennsylvania was to Big Pocono, also known as Camelback Mountain, 2111 feet. . . . The *Special Color* hike of the Community Hiking Club (Reading, Pa.) was routed to the Gibraltar Hills. . . . Open House was maintained at Camp Thendara over the Columbus Day week-end by New York section of the Green Mountain Club. . . . Autumn program of Wisconsin Outers Association calls for two planned trips a month. Chance trips, starting from a central meeting place, will be made other Sundays. . . . Bear cubs love to chew the blue paint blazes on Maine A-T side trails. . . . Don't begrudge carrying an extra pair of woolen socks in cold weather. They will be welcome "spares" if your gloves become soaked. . . . A *Starlight* hike through woods and meadows, with the heavens in perfect accord, was one wonderful night to 13 members of the Walther League Hiking Club, Chicago. . . . Hazelhurst camp of the Prairie Club is proud of its Circle Trail, laid out by E. A. Schulze with an eye to scenic beauty—wooded slopes and sand dunes. . . . Eastern States Mountain Club (Maine) has acquired a clubhouse on lower slopes of Ossipee Mountain. The 50-acre tract includes an old farmhouse, remodeled for the E. S. M. C. as an overnight base. Arthur M. Fogg is E. S. M. C. president. . . . British Columbia Mountaineering Club is, we believe, the first North American club to use seaplanes for regular transportation. Now they can reach difficult back country terrain within an hour from Vancouver.



PHOTOGRAPH BY ALFRED A. MONNER

ON THE SKI TRAIL TO THE WY'EAST CLIMBERS' CABIN

Plenty of lakes among these hinterland ranges afford desirable landing stages. . . . An experienced geographic committee of the Sierra Club is completing the naming of High Sierra features. Aboriginal and scenic trends of the recommendations will be laid before the proper authorities. Chairman Chester Versteeg had the luck to appraise all sides of an unnamed mountain during two separate storms. Versteeg calls it *Cloud Ripper*. . . . Hip pockets of breeches usually remain dry in wet weather, so transfer your pocket book there. Outside pockets do not have the body friction to which the middle pockets are subjected. . . . You have to thank the Potomac Appalachian Trail Club for the bunks in the lean-tos on the Appalachian Trail in the Michaux State Forest (Pa.). PATC provided the wire and framework, while the CCC did the installation. . . . First to walk the entire length of the Horse-Shoe Trail were three members of the Nature Ramblers. Not content with that, they continued from Manada Gap to the Susquehanna—a total of 179¾ miles in 7 days. This Philadelphia club maintains 29¾ miles of the H-ST.

Gadgets—Still They Come

1. The Forum editor has worn, without repairs, a leather-top rubber boot along about 535 miles of trail in six eastern states since spring.

2. A strongly-built, handsome-appearing knapsack which Forum editor found too small for his one-day hikes. Pack refuses to stretch beyond its normal capacity. Several young women in the F. e.'s club admire it for this reason, so the F. e. recommends it as a lady's pack.

3. A light-weight, one-piece metal axe suitable when weight in the pack is a consideration.

4. Pre-cooked navy beans in a paper carton. No can or liquid content to carry. Cook in warm water and they are ready in 20 minutes instead of 10 hours.

5. Single page of a certain catalog is devoted to sturdy outdoor clothing and footwear in boys' sizes. Organizers of "Father and Son" hikes will find inspiration here.

6. A portable backrest suitable for picnicking and motor camping. The folded roll weighs 3 lbs. The hardwood slats, held together by heavy khaki duck, open like a legless chair.

7. A new bottled paste preparation, clean to handle, for which exceptional strength is claimed. Will repair hiking clothing and canvas camp equipment.

8. Wearers of rubber boots above the knees will be interested in a cushion insertion. Resembling a rubber sponge, it is cemented inside the boot. Maker promises relief for knee chores about camp or in a boat.

To secure full information on the above eight items, ask for the December Gadget List, and enclose a stamped addressed envelope.

Wy'easters of Oregon

Youngest of the three Portland (Oregon) clubs is the Wy'east Climbers, established December, 1930. At first it ran without benefit of a name, but the later choice, Columbian Hikers, was discarded in favor of the old Indian title for Mount Hood.

All the 20 members are men. Joseph Leuthold is president. A monthly bulletin, edited by Alfred A. Monner, records the club activities. The greatest W'e climber is Ole E. Lien, who has more than 100 ascents of Mount Hood to his credit since 1923.

In the summer of 1934 a desirable permanent cabin site was secured at timberline in the Mount Hood National Forest. Hard-working Wy'easters erected a presentable two-story building of the chalet type on this site. Up there they get deep snows, but the door, thanks to the sloping location of the site, can be used even when there are 10- to 15-foot drifts.

Hot Vacuum Bottle Coffee

"I dislike that vacuum bottle taste," growls a hiker about his luncheon coffee. Perhaps he neglects to wash out the bottle properly between trips. He now uses his bottle as a carrier of piping hot water. He takes along the soluble mixings—either two tea balls, prepared powdered coffee or bouillon cubes. At lunchtime he inserts the ingredients in the cup and pours hot water over them.

Too often hikers blame the vacuum bottle whereas their filling methods are at fault. The common mistake is to fill the bottle *directly* from the percolator, adding milk and sugar to taste. The cold milk lowers the temperature of the coffee:

Right method: First temper the bottle with hot water, and empty. This goes, too, for the cup and cork. Fill a pan with three cups of coffee to give you a generous allowance for a pint bottle, as some is usually spilled in the delicate transferring operation. Add milk and sugar, stir, and bring to a boil.

These are the days when piping hot coffee is doubly appreciated, so it pays to take a little more care in its preparation at home.

District of Columbia Walks

The Potomac Trail Book outlines 24 separate walks, from 2.5 to 11 miles each, along the Maryland and Virginia shores of the Potomac River. Numbered circles designate the routes on the map inserted at the back of this paper-bound volume. Supplementary chapters give the flora, fauna and other features of the district.

We deplore the one false note in this useful guide—the encouragement of hitch hiking. Two such references figure among the transportation suggestions. The chronic "thumber" and the recreational hiker live in worlds apart. The latter prizes his self-respect and independence.

The author is Robert Shosteck, trail leader of the Wanderbirds, sponsored by the Washington *Post*, who publish the book at 50 cents.

What's This Kabob?

A male hiker has absolutely no chance of belonging to the Kabob Hiking Club unless able to produce a fire by friction—the rubbing of sticks. Even though rain, snow or sleet may handicap his efforts, matches are prohibited.

Lady members must possess—or acquire—the knack of cooking meat in the "kabob" style. Take pieces of meat (your own preference) and cut into two-inch squares. String these on a stick about the thickness of your thumb, wedging slices of onion between the meat layers. Broil over glowing embers. Two hours are allowed for the evening meal on each monthly hike of about six miles.

As the membership of this Pennsylvania club is restricted to 35, activity is ensured by dropping any member who absents himself from two consecutive hikes. Edward Lingle is president, and Alice Rudy, secretary of the K. H. C. All business meetings are held on the hikes.

European Camping Fraternalism

The International Federation of Camping Clubs recently held its annual camp and congress at Brussels. The four countries sending the most campers were Belgium, 430; France, 424; Great Britain, 200, and Holland, 101. Eight other European nations had smaller delegations.

European campers are becoming less insular as they experience or learn of the fraternity spirit of these gatherings. Only 50 foreign campers crossed to England for the first camp meet in 1933. Next year's tent assembly will be at Barcelona, Spain.

Special camping site maps of Europe are used by the 22 countries affiliated with the I. F. C. C. Uniform picture symbols bridge language difficulties, in indicating the characteristics of approved sites, as, for example: *Faucet,* drinking water available. *Flame,* campfires permitted. *Blade of Grass,* Unwooded site. *Small Car,* accessible by auto. *Four Stones,* a stony location. *Two Trees,* wooded site.

Organized camping in North America is generally an offshoot of some other outdoor activity. This condition also prevails in some of the smaller European countries, where the I. F. C. C. has cooperative arrangements with canoe or motoring clubs or tourist bodies.

NATURE IN PRINT

As a convenience to readers the books reviewed in this department of Nature Magazine may be ordered through the book department of the American Nature Association.

Explore Your Yard

"To fill a gap in Nature literature and to illustrate the possibilities of exploration at home are the chief reasons for this book," says Paul Griswold Howes of his volume entitled *Backyard Explorations.* It is a fascinating book, first published in 1927 and now brought out in a revised and enlarged edition that is amply warranted by the popularity of the first edition. This volume opens the door to an amazing world within the reach of everyone, a world as fascinating to explore as the far corners of the earth. One of its finest features is in the direction of illustration, Mr. Howes having drawn upon his splendid file of negatives for 225 of these fascinating pictures. We heartily recommend this volume as a foundation book in any Nature library. The publishers are Doubleday Doran and the price is three dollars.

Growing Ferns

The possibilities of ferns as a part of the garden scheme have been overlooked by many gardeners, partly, perhaps, because of ignorance of their propagation and partly because of lack of acquaintance with them. *American Ferns* by Edith A. Roberts and Julia R. Lawrence will, we trust, serve to introduce many flower and garden lovers to the real beauties of these plants. Besides providing valuable information on the growing and use of ferns in the landscape scheme the authors have included a key for the identification of ferns and a table showing the time for spore collection and other seasonal habits of these plants. There are many splendid illustrations. The publishers are Macmillan and the price is $2.50.

It's a Wonderful World

Our Wonderful World by Frances Jenkins Olcott is an interesting and useful book, difficult to classify because it is different. The author has assembled between two covers a varied and fascinating collection of Nature material. Applying the method of the "digest" type of magazines, she has condensed articles from many sources and has contributed many herself, classifying them under the wonders of the sea and beach, sky and air, earth, fire, water, electricity, growing things, animal kingdom and insectdom. The text is supplemented by attractive illustrations and the book is published by Little, Brown and Company at $2.50.

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Bordered with Flowers

"When your pathway is bordered with flowers it leads you into another world." This is the central thought of a little book which has just come from the press, entitled *The Book of Annuals.* Written by Dr. Alfred C. Hottes, associate editor of *Better Homes and Gardens,* and issued by the A. T. De La Mare Company of New York, it is a cloth-bound volume of 171 pages, profusely illustrated, prepared for the ever increasing throng of amateurs who grow flowers for the love of them. It comprises a brief account of the vast group of alluring annual flowers, and constitutes a guide through the season of annual bloom. Its chapters treat of such themes as: Use of annuals; ordering seed; classes of annuals; sowing seed; transplanting; pinching; the hoe vs. the hose; water vs. sprinkling; hotbeds and coldframes; forcing annuals in the greenhouse; table for forcing annuals; select list of annuals; families of annuals; everlastings; decorative seed pods; ornamented grasses; annual vines; and index of plant names. Considerable practical information also has been included dealing with selection of plants with reference to a specific purpose or a particular kind of locality, as: fragrance or odor; flowers for picking; for seashore and mountains; for temporary hedges; for poor soil; for hot or dry places; for moist places; for window and porch boxes, et al. Since Garden clubs in every community are filling a distinct place in American life and gardening has been elevated to one of the social graces as well as being a common pastime for all ages of people, this little book will have an honored place on the shelves of the flower lover wherever located.

The Solar System

What is the extent of our present-day knowledge of the whys, wherefores and whences of the solar system? This question is simply and lucidly answered in *The Solar System and its Origin* by Henry Norris Russell, Professor of Astronomy at Princeton University. This volume will be of interest to lay astronomers and should be eminently valuable as a supplementary text for students of the celestial regions. The book is published by Macmillan and sells for two dollars.

About the Gaspé

It is interesting to speculate as to just how many vacationists this past summer have visited the Gaspé country. Indeed, the traveler's phrase "Around the Gaspé" is now quite familiar, and has become so since the opening a short time ago of the road down the south shore of the St. Lawrence River. For this has enabled many people—even thousands—to make by auto a complete circuit of one of the greatest peninsulas of the North American continent. Now that such a region has become of relatively easy access, the newly-issued book entitled *The Gaspé,* by John M. Clark, and published at $3.00 by the Yale University Press, will have a wide appeal. It has been well said that the Gaspé is the geologist's paradise; but because of its peculiar relation to the last ice age, it is the botanist's paradise as well;

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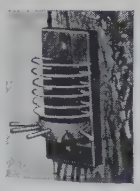

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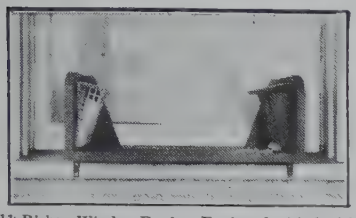

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and, if only because of Bonaventure Island, the ornithologist's paradise; and so on. Also, to the casual inspector of flora, fauna, and avifauna, to the traveler and fisherman, and to that person with an appreciation of the unspoiled original scene, it becomes indeed fascinating ground. Even some of the chapter headings of this volume carry a vague appeal: The cadence of the roads; the St. Lawrence pathway; Gaspé, Chez Lui; the Days of the Seigneury; Her Majesty, Percé; geology at Percé; Table-à-Rolante; Percesia; the cries of the sea-fowl; and solstice and equinox. There are also included a number of interesting references to recent literature for the convenience of those who may desire more extended reading. The pen and ink sketches for this book were done by Esther Kingsbury. Being a blend of reveries and realities, history and science, and description and narration, the volume becomes a veritable signpost to the traveler in the Gaspé Peninsula.

René Bache

Long a familiar figure around Washington, and widely recognized as a highly talented exponent of popular science writing, René Bache (1861-1933) will be remembered as one of those men who turned what was all too often the dry-as-dust facts of natural history into news and made the public like it. At the height of his career as a writer his daily articles were syndicated over a good portion of the civilized world. A little book containing the story of his life has just appeared under the authorship of his sister-in-law, Miss Violet Biddle, and published at $1.50 by Dorrence & Company of Philadelphia. This contains a vivid and sympathetic account of his career and will be of interest not only to his many personal friends but as well to all those who care to know more about the growth and development of that field of writing by which the things of natural science and of nature study have been transformed from a plethora of technical detail to a popularization of such skill and cleverness that he who runs may read.

A Whistling Post

We have just encountered a charming little book of Nature essays and prose vignettes under the title of *Whistling Post, Ohio.* It is the work of Walter Locke and is published by the Antioch Press at $1.50. It is a collection of seasonal essays inspired by contact with Nature at what we gather is a suburban retreat of the author and his family. In fact, it might be made a little clearer as to what the whistling post is and what its physical characteristics really are, thus giving the reader a more intimate feeling of being there. Nevertheless, the word pictures of the country and its wild wealth are delightfully done and reveal a sincere and broad appreciation and understanding of Nature.

Leaf-Nosed Snake

Number Twelve of the series of Bulletins issued by the Zoological Society of San Diego is devoted to *Phyllorhynchus,* the Leaf-Nosed Snake, and will be of distinct interest to those interested in reptiles. The Bulletin is written by L. M. Kauber, Curator of Reptiles.

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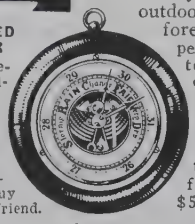

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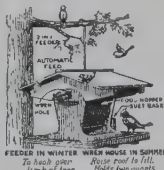

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The Klondike Nugget

The lover of the outdoors soon learns never to be surprised when he comes upon the things of Nature in the most unexpected places. Even the records of a stampede to the Klondike could not leave out entirely observations of value on the natural history of one of the world's most interesting places, the Yukon. The little volume entitled *The Klondike Nugget,* by Russell A. Bankson (published at $2.50 by the Caxton Printers, Caldwell, Idaho), depicts with dramatic intensity the struggle of one of the stampeders, Eugene C. Allen, who joined the great gold rush into the land of the midnight sun in 1898, to Dawson City on the Yukon, where he founded the world's farthest North newspaper, which he called *The Klondike Nugget,* which was a means by which he exerted a profound, far-reaching influence for good on his associates. The copious extracts quoted in the book from the files of that newspaper form not only records of the day by day happenings around Dawson City during that period, but also give the author's observations on and reaction to the numerous and varied Nature themes all about him. Those who enjoy study of the great outdoors in its manifold aspects during the winter's cold of the great North will find this little volume of interest.

Youthful Sparrows

An interesting study of youth among several species of sparrows found in Michigan is the subject of the latest Bulletin of the Cranbrook Institute of Science at Bloomfield Hills, Michigan. Precisely, the title is *The Juvenal Plumage and Postjuvenal Molt in Several Species of Michigan Sparrows.* This is the work of George Miksch Sutton and will be of interest to many bird lovers and students. The Bulletin is illustrated by eight color plates by the author. The price is fifty cents.

Death to Dandelions

If you want to get rid of dandelions in your lawn all you have to do is fill an oil can with gasoline and place a drop on the crown of each plant, according to R. G. Arnold of Denver, Colorado. Small plants, he says, can be killed by placing the gasoline on a leaf and letting it run down to the crown, which must be saturated. Any well-formed buds will mature and ripen seeds on a dead plant unless they get a drop of gasoline also.

A Forestry Text

Designed as a forestry text, and giving special reference to the rapidly changing forest conservation picture of the past few years, *A General Introduction to Forestry in the United States* should find ready use in forestry schools and among foresters. This is the work of Nelson Courtlandt Brown of the New York State College of Forestry at Syracuse University. The publishers are John Wiley and Sons and the price is $3.25.

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